

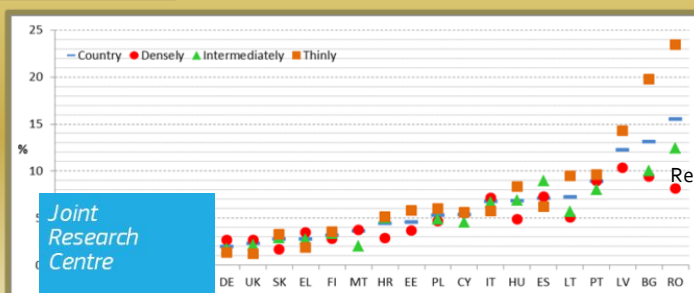
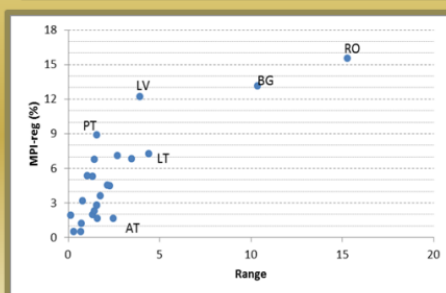
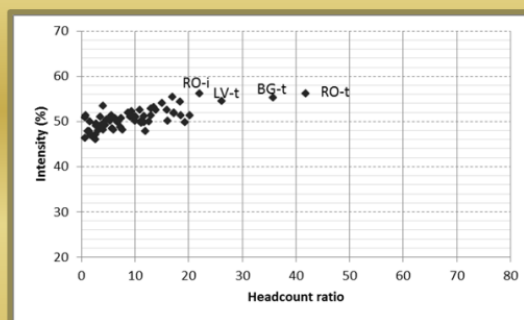
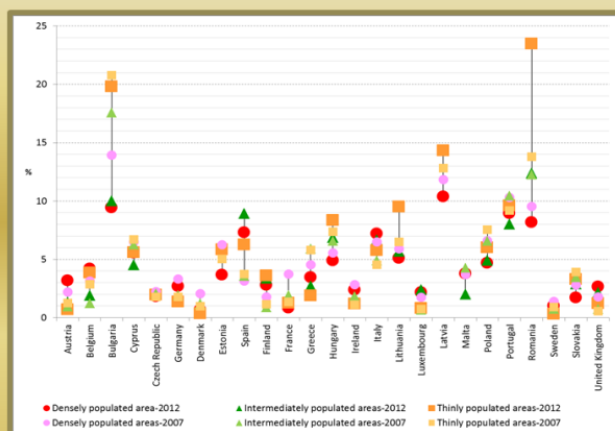
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Monitoring multidimensional poverty in the regions of the European Union. Analysis of situation in 2012 and 2007

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Abstract

In this study, we measure the area-specific poverty in the European Union (EU: (i) using the EU nomenclature of territorial units (NUTS 1 mostly); (ii) using different with respect to the degree of urbanisation areas within countries. With the data from the European Union Survey on Income and Living Conditions (EU-SILC), we formulate the Index of Multidimensional Poverty at the regional level, namely the Multidimensional Poverty Index (MPI-reg). The MPI-reg framework comprises three dimensions — health, education, and standard of living — quantified by three sub-indexes: Multidimensional Poverty in Health Index (MPI-H), Poverty in Education Index (MPI-E) and Multidimensional Poverty in Living Standards Index (MPI-L), respectively.

In 2012 the MPI-reg was computed for 24 EU countries with Croatia included. Our results show that the level of poverty in the EU ranges from 0.5 % to 13-15 %, with Denmark and Sweden having unequivocally the lowest share of poor people and Latvia, Bulgaria and Romania, having the largest share of poor people. It must be noted, however, that generally, comparing to the situation in 2011, poverty level decreased. The only considerable exception from this reasoning is Portugal where the MPI-reg increased (1.3 pp.). On the other hand, the most significant decrease in the MPI-reg was recorded in Latvia, Bulgaria, and Romania, i.e., in the least affluent countries with respect to the MPI-reg.

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1. Executive summary

In 2010, the Europe 2020 strategy was introduced in the European Union (EU). This initiative describes the EU's strategy for smart, sustainable and inclusive growth. It enumerates five objectives to be reached, namely on employment, innovation, education, social inclusion and climate/energy. To fulfil the aim related to social inclusion, first, the European platform against poverty and social exclusion was launched with the aim of helping the EU countries reach the headline target of lifting 20 million people out of poverty and social exclusion. Second, considerable funds were earmarked: among them, the Fund for European Aid to the Most Deprived has recently been accepted for implementation, under which a range of non-financial material assistance including food, clothing and other essential goods for personal use such as shoes, soap and shampoo, to the most materially-deprived people will be provided.

Then, in 2012, 124.5 million people, or 24.8 % of the population, in the EU-28 were at risk of poverty or social exclusion, compared with 24.3 % in 2011 ⁽¹⁾. These numbers change considerably when poverty is analysed between countries, age groups or genders. It can also be assumed that the same reasoning applies when poverty is analysed between sub-national regions. Unfortunately, information about the distribution of poverty at the sub-national level is very limited, which is surprising as the EU regions, not countries, are the key elements of the European Union's regional policy (Becker, Egger, & von Ehrlich 2010) and local differences in poverty are essential to properly target the policies to alleviate the causes and consequences of poverty.

With this in view, it seems reasonable to provide a measure of non-income poverty that, next to the 'at-risk-of-poverty or social exclusion' (AROPE) rate, which combines both income and non-income indicators, will enable: (i) better assessment of who requires such aid the most; (ii) the assessment with respect to broadly understood non-income poverty (e.g. poverty in education, poverty in health, poverty in environment of good quality, poverty in social security); (iii) the assessment at sub-national level (e.g. taking into account areas differing with respect to density of population). In this paper, we attempt to propose such a measure.

¹ 'People at risk of poverty or social exclusion', *Statistics Explained* (2014/1/3) (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/People_at_risk_of_poverty_or_social_exclusion).

Therefore, in this study, we measure the area-specific poverty in the EU. To this end, we propose to base the measurement of poverty on the approach currently used by the United Nations (UN), namely the Multidimensional Poverty Index (UN-MPI) by Alkire and Santos (2010, 2013); and measure poverty at the sub-national level using different with respect to the degree of urbanisation areas within countries.

With this in view, in this report using a measure of multidimensional non-income poverty, namely the EU Multidimensional Poverty Index at the regional level (MPI-reg), we present the distribution of non-income poverty in the EU in 2012. We also compare the situation with this respect between 2007 and 2012. In general, the aim of this report is to provide the updated information about non-income poverty following the approach proposed by Alkire and Foster (2011a, 2011b) and Alkire and Santos (2010, 2013). To this end, we keep the structure of the report as similar as possible to the structure of the report released previously (see Weziak-Bialowolska & Dijkstra 2014). It implies that some sections may be the same as in the previous report but this is intentional because we want this report to constitute complete, independent publication.

Although, originally, the MPI-reg was an aggregate measure of poverty, meaning that the index shows poverty in three dimensions (i.e. standard of living, health and education), by one number, we opt to calculate not only the fully aggregated MPI-reg but also the indexes for all three conceptualised dimensions of poverty. In making this decision, we follow the reasoning that in order to prioritise policies for fighting poverty in a given country (or other geographic area), it is necessary to look at the country's attainments in various dimensions, rather than focusing on its performance with respect to a single composite index.

Thus, in the approach we apply, the MPI-reg framework comprises three dimensions — health, education and standard of living — quantified by three sub-indexes: Multidimensional Poverty in Health Index (MPI-H), Poverty in Education Index (MPI-E) and Multidimensional Poverty in Living Standards Index (MPI-L), respectively. The results with respect to each of them, as well as with respect to the MPI-reg are presented.

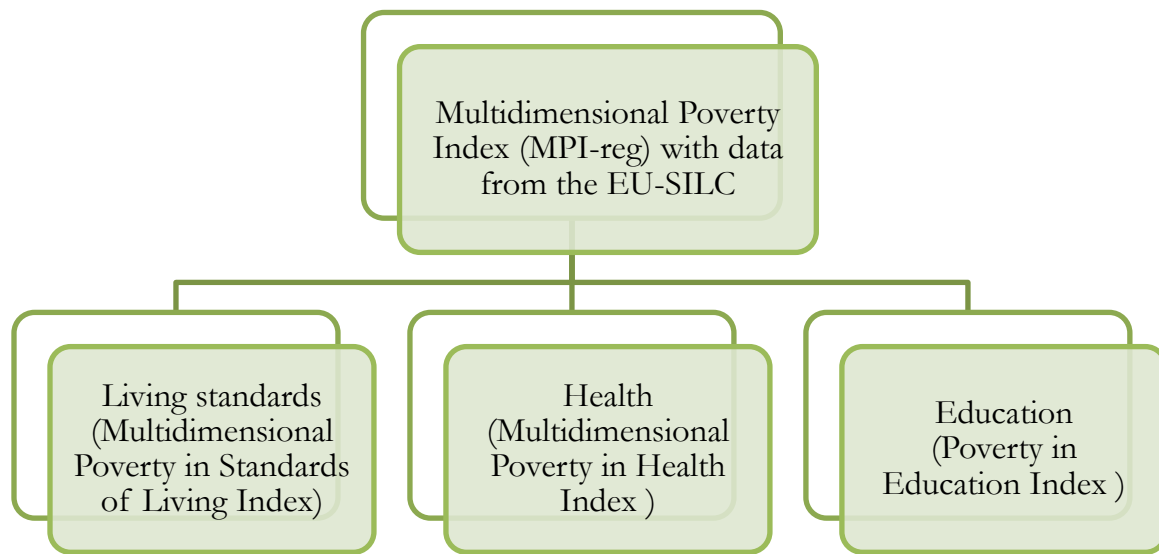


Figure 1: Framework of the analysis

To the best of our knowledge, studies on multidimensional poverty distribution between different types of urbanisation areas in the EU countries are considerably limited. Thus, the aim of this report is to address this gap by investigating multidimensional non-income poverty.

The MPI-reg has two useful properties. First, it provides information about the absolute magnitude of poverty experienced by Europeans in a given country and provides information about the relative standing of the country. Second, due to its disaggregation properties, the MPI-reg shows the variability of poverty within a country with respect to (i) the degree of urbanisation and (ii) the NUTS level.

The developed measure of poverty (MPI-reg) has some limitations. First, the conceptual model of the MPI-reg relies largely on the available data. Although research on poverty has developed rapidly in recent years, it has failed to guide us in establishing aggregation weights or a commonly accepted poverty threshold. This failure led us to formulate certain a priori assumptions. Specifically, we applied a particular weighting scheme and particular poverty thresholds. These assumptions, if biased, could have led us to incorrect results: to minimise this risk, we formulated our conceptual model on the basis of a literature review, which was both comprehensive and inclusive of the most

recent studies. Unfortunately, due to large sample sizes we were not able to perform an uncertainty analysis to show the possible range of volatility of the MPI-reg scores.

In 2012 the MPI-reg was computed for 24 EU countries. Unfortunately, due to data unavailability calculations for Belgium, Ireland, the Netherlands, and Slovenia were not executed. However, it was the first time when poverty was assessed for Croatia. Our results show that the level of poverty in the EU ranges from 0.5 % to 13-15 %, with Denmark and Sweden having unequivocally the lowest share of poor people and Latvia, Bulgaria and Romania, having the largest share of poor people. It must be noted, however, that generally, comparing to the situation in 2011, poverty level decreased. The only considerable exception from this reasoning is Portugal, where the MPI-reg increased (1.3 pp.). On the other hand, the most significant decrease in the MPI-reg was recorded in Latvia, Bulgaria, and Romania, i.e., in the least affluent countries with respect to the MPI-reg.

We also see that there is a positive relationship between the stratification level and all adjusted headcount ratios, headcount ratios and intensity of poverty scores. This positive relationship implies that there are countries where there is small stratification with respect to poverty (e.g. Sweden, Denmark, the Czech Republic and Finland) and countries, usually poor ones (e.g. Romania, Bulgaria and Lithuania), where considerable stratification with respect to poverty occurs. In general, in the lowest and moderately low scoring countries, the worst situation with respect to poverty is observed in sparsely populated areas, and the best situation occurs in densely populated areas. On the other hand, in the best scoring countries, poverty is relatively higher in the densely populated areas compared to the less well-populated areas.

The results confirm our previously published findings (see Weziak-Bialowolska & Dijkstra 2014) that the European Union regions are strongly diversified with respect to poverty. This implies that considerable within-country differences are indicated. Therefore, relying only on countrywide estimates may be misleading when properly assessing the relative standing of a region with respect to poverty.

2. Introduction

In 2010, the Europe 2020 strategy was introduced in the European Union (EU). This initiative describes the EU's strategy for smart, sustainable and inclusive growth. It enumerates five objectives to be reached, namely on employment, innovation, education, social inclusion and climate/energy. To fulfil the aim related to social inclusion, first, the European platform against poverty and social exclusion was launched with the aim of helping the EU countries reach the headline target of lifting 20 million people out of poverty and social exclusion. Second, considerable funds were earmarked: among them, the Fund for European Aid to the Most Deprived, under which a range of non-financial material assistance including food, clothing and other essential goods for personal use such as shoes, soap and shampoo, to the most materially-deprived people will be provided.

Then, in 2012, 124.5 million people, or 24.8 % of the population, in the EU-28 were at risk of poverty or social exclusion, compared with 24.3 % in 2011 ⁽²⁾. These numbers change considerably when poverty is analysed between countries, age groups or genders. It can also be assumed that the same reasoning applies when poverty is analysed between sub-national regions. Unfortunately, information about the distribution of poverty at the sub-national level is very limited, which is surprising as the EU regions, not the countries, are the key elements of the European Union's regional policy (Becker et al. 2010) and local differences in poverty are essential to properly target the policies to determine the causes and alleviate consequences of poverty.

With this in view, in this report using a measure of multidimensional non-income poverty, namely the EU Multidimensional Poverty Index (MPI-reg)³, we present the distribution of non-income poverty in the EU in 2012. We also compare the situation with this respect between 2007 and 2012. In general, the aim of this report is to provide the updated information about non-income poverty following the approach proposed by Alkire and Foster (2011a, 2011b) and Alkire and Santos (2010, 2013). To this end, we keep the structure of the report as similar as possible to the structure of the report released previously (see Weziak-Bialowolska & Dijkstra 2014). It implies that some sections

² 'People at risk of poverty or social exclusion', *Statistics Explained* (2014/1/3) (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/People_at_risk_of_poverty_or_social_exclusion).

³ more about it can be found in Weziak-Bialowolska & Dijkstra (2014)

may be the same as in the previous report but this is intentional because we want this report to constitute complete, independent publication.

In this report we measure poverty between different types of urbanisation areas in the European Union (EU) countries in 2012. In particular, we provide information about the absolute magnitude of poverty experienced by the Europeans in a given country in 2012 and provide information about the relative standing of the country. Second, due to the disaggregation properties of the MPI-reg we show the variability of poverty within a country with respect to the degree of urbanisation and NUTS.

Next to its advances, the developed measure of poverty (MPI-reg) has also some limitations. First, the conceptual model of the MPI-reg relies largely on the available data. Although research on poverty has developed rapidly in recent years, it has failed to guide us in establishing aggregation weights or a commonly accepted poverty threshold. This failure led us to formulate certain a priori assumptions. Specifically, we applied a particular weighting scheme and particular poverty thresholds. These assumptions, if biased, could have led us to incorrect results. To minimise this risk, we formulated our conceptual model on the basis of a literature review, which was both comprehensive and inclusive of the most recent studies. Unfortunately, due to very large sample sizes we were not able to perform an uncertainty analysis to show the possible volatility of the MPI-reg scores.

Our study has clear implications for future research. First, this study calls the MPI-reg to be calculated for all EU countries with a degree of urbanisation as a breakdown variable. Further, an in-depth empirical research, most likely employing individual-level data and multi-level modelling, is necessary to test the usefulness of the MPI-reg.

This report comprises seven sections. First, we present the concept of poverty. Second, we focus on the multidimensional nature and measurement of poverty. Third, we briefly describe the approaches to poverty measurement applied by the United Nations, namely the Multidimensional Poverty Index. Fourth, the approach to poverty measurement at the sub-national level is discussed. In these sections, we present data and conceptualisations and the following section presents the results. The final section concludes.

3. Concept of poverty

The standard of people's lives both in relative terms, as compared to other people in society, and in absolute terms, whether they enjoy life's basic necessities, is a reflection of whether or not people are in poverty. However, the notion of poverty is understood differently in different contexts (Callander, Schofield, & Shrestha 2012). According to Wagle (2008) and Saunders (2005), there are three main approaches in the conceptualisation and operationalisation of poverty: (i) economic well-being, (ii) capability and (iii) social inclusion.

The **economic well-being concept** links poverty to the economic deprivation that, in turn, relates to material aspects and/or standards of living. According to Wagle (2008) and Boulanger et al. (2009), the notion of economic well-being relates to the physical quality of life or welfare, for which consumption of food, clothing, shelter and other basic necessities — such as being able to afford adequate healthcare and being in good health, are crucial. Therefore, the perfect measure of poverty in terms of economic well-being should be a combination of not only income, but also consumption and welfare. It must be noted, however, that although the measurement of income is not a problematic issue, at least to some extent, the measurement of consumption level and welfare is not straightforward.

The **capability approach** proposed by Sen (1993) expands the notion of poverty from welfare, consumption and income to broader concepts like freedom and well-being. Poverty is understood as the deprivation of 'capabilities' and 'functionings': 'capabilities' are things a person is able to do or which enable them to lead the life they currently have and 'functionings' represent achievements that a person is capable of realising. Later on, Sen (2002) modified the capability approach relating it to the opportunities and the 'process aspect of freedom'. In this extension, opportunities correspond to the ability to make outcomes happen and the process of achieving the outcomes is valuable in itself.

The third approach, based on **social inclusion**, is the opposite of social exclusion. Social exclusion relates to a state or situation and stems from the process of systematic isolation, rejection, humiliation, lack of social support, and denial of participation (Wagle, 2008); it focuses on deficiencies while the capability approach focuses on possibilities and abilities. The last two approaches expand the notion of poverty from purely economic perspective to a more sociological point of view.

Hagenaars and de Vos (1988) report that three types of poverty can be distinguished:

- absolute — implying that poverty is having less than an objectively defined, absolute minimum;
- relative — meaning that poverty is having less than others in society;
- self-assessed — poverty is feeling that you do not have enough to get along.

Each of these types has two dimensions: material and non-material. Furthermore, the first two can be described as objective, whilst the last is subjective.

Absolute poverty measures the individual capacity to afford basic needs such as being adequately nourished, making ends meet, having decent housing, affording adequate healthcare and being in good health (Boulanger et al. 2009). On the one hand, its measures can be based on non-monetary indicators describing the ability to acquire a minimum level of food calorie intake, a minimum basket of consumption goods, a level of individual welfare or utility, such as access to adequate food, clothing, housing and the affordability of health and dental care needed to live a basic life (Boulanger et al. 2009; Hagenaars & de Vos 1988). On the other hand, it can be based on monetary measures such as ratios of food expenditures, fixed costs or total expenditures related to income (Hagenaars & de Vos 1988).

Relative poverty captures the condition of the individual compared to the situation of other people. People may feel worse off not because they are poor but because they are poorer compared to other people. Relative measures of poverty are then of key relevance for measuring the actual level of material satisfaction. They can also be treated as approximate measures of income inequality as a society with a more equal income distribution will have low relative poverty.

Self-assessed poverty is based on the subjective opinions of a person who can decide whether or not they are in a difficult financial situation (Betti et al. 2001). It is operationalised through the survey-based questions in which the respondent/household states either the minimum level of income, consumption or welfare necessary to assure non-poor life or the level of satisfaction with income/standard of living (Wagle 2008).

Depending on the type of definition, different indicators are chosen. They can be generally classified into income and non-income related. Fortunately, and contrary to what Hagenaars and de Vos (1988) stated several years ago, economic or social policy research (although just one definition is generally used, disregarding the others), tries to measure poverty in multidimensional way (Ravallion, 2011). The only example where poverty assessment is based on one indicator only is income

poverty. However, even in this case, the available measures of poverty are sufficient to show it from different perspectives (see Foster, Greer, & Thorbecke 1984, 2010).

Since the choice of the definition and thus the indicators affect the results, the multidimensional approach to poverty conceptualisation and operationalisation seems to be reasonable. There are numerous proponents of such an approach, for example Alkire and Foster (2011a, 2011b), Alkire and Santos (2013), Antony and Visweswara Rao (2007), Bellani (2012), Betti et al. (2012), Callander et al. (2012), Ravallion (2011) and Wagle (2008). In their studies, the poverty concept not only has numerous dimensions but its measurement instrument comprises monetary and non-monetary indices.

In this report, we focus on poverty understood as economic well-being, or economic deprivation. We provide a multidimensional measure of poverty at the sub-national level. Poverty measurement comprises three dimensions: poverty in education, poverty in health and poverty in living standards. Not only do we provide an aggregated measure of multidimensional poverty but also for each individual poverty dimension, namely poverty in education, poverty in health and poverty in living standards. To be in line with the variety of poverty definitions used to assess poverty, we use non-monetary indicators representing both objective and subjective measures of absolute poverty. No direct measure of perceived poverty level is included in the analysis due to the lack of reliable data at the sub-national level.

4. The Multidimensional Poverty Index applied by the United Nations

There is a vast amount of literature on multidimensional poverty measurement (e.g. Ravallion 2011). Among all available approaches, we chose the approach adopted by the United Nations (UN) because it was requested by the Directorate-General for Regional and Urban Policy and it was in line with what had been done in the past by the Directorate-General for Regional and Urban Policy (see Bubbico & Dijkstra 2011). Additionally, we decided to base the MPI-reg on the UN approach because, by checking if a person is deprived with respect to one or more poverty dimensions, it ensures multidimensional poverty measurement.

Starting from 2010, the UN has measured poverty using the Multidimensional Poverty Index (UN-MPI) developed by the Oxford Poverty & Human Development Initiative and the United

Nations Development Programme (Alkire et al. 2011; Alkire & Santos 2010). The UN-MPI is an index of acute multidimensional poverty in developing countries. It shows the number of people who are multidimensionally poor (suffering deprivations in at least 33 % of weighted poverty indicators) and the number of deprivations with which poor people typically contend. It reflects deprivations in very rudimentary services and core human functioning for people across 104 countries. Although deeply constrained by data limitations, the UN-MPI reveals a different pattern of poverty than income poverty, as it illuminates a different set of deprivations.

4.1. Framework of the UN-MPI

The UN-MPI has three equally weighted dimensions — standard of living, health and education — and identifies the proportion of people that are multidimensionally poor. The multidimensionally poor person is a person who belongs to a household that is deprived in some combination of poverty indicators whose weighted sum exceeds 33 % of deprivations.

Table 1: The dimensions, indicators, deprivation thresholds and weights of the UN-MPI

Dimension	Indicator	Deprived if...	Related to...	Relative Weight
Education	Years of Schooling	No household member has completed five years of schooling	MDG2	16.7%
	Child Enrolment	Any school-aged child is not attending school in years 1 to 8	MDG2	16.7%
Health	Mortality	Any child has died in the family	MDG4	16.7%
	Nutrition	Any adult or child for whom there is nutritional information is malnourished*	MDG1	16.7%
Standard of Living	Electricity	The household has no electricity		5.6%
	Sanitation	The household's sanitation facility is not improved (according to the MDG guidelines), or it is improved but shared with other households	MDG7	5.6%
	Water	The household does not have access to clean drinking water (according to the MDG guidelines) or clean water is more than 30 minutes walking from home.	MDG7 MDG7	5.6%
	Floor	The household has dirt, sand or dung floor		5.6%
	Cooking Fuel	The household cooks with dung, wood or charcoal.	MDG7	5.6%
	Assets	The household does not own more than one of: radio, TV, telephone, bike, or motorbike, and do not own a car or tractor	MDG7	5.6%

Note: **MDG1** is *Eradicate Extreme Poverty and Hunger*, **MDG2** is *Achieve Universal Primary Education*, **MDG4** is *Reduce Child Mortality*, **MDG7** is *Ensure Environmental Sustainability*.

* Adults are considered malnourished if their BMI is below 18.5. Children are considered malnourished if their z-score of weight-for-age is below minus two standard deviations from the median of the reference population.

Source: Alkire and Santos (2010).

All poverty estimates come from the Demographic and Health Surveys, the United Nations Children's Fund Multiple Indicator Cluster Surveys and the World Health Organisation World Health Surveys conducted between 2000 and 2010. A full list of surveys used for 2012 MPI estimations can be found in UNDP (2013).

4.2. UN-MPI Methodology

The UN-MPI belongs to a family of multidimensional poverty measures proposed by Alkire and Foster (Alkire & Foster 2011a, 2011b). This measure corresponds to Adjusted Headcount Ratio and is used whenever one or more of the indicators are of ordinal nature. The UN-MPI is a measure of poverty at the individual level; however, it uses data at the household level (Alkire et al. 2011; Alkire & Santos 2010). Thus, a methodology to define the poverty status of an individual is the following:

1. for each household, it is decided if the household is poor or not with respect to each dimension;
2. the calculation of the deprivation score for each household is made — this is a weighted sum of the deprivations experienced and lies between 0 (when a household is not deprived in any indicator) and 1 (when a household is deprived in all 10 indicators);

3. for each deprived/poor household, it is decided if it is multidimensionally poor — to establish this, the poverty cut-off (the share of weighted deprivations a household must have in order to be considered poor) of 33 % is set: then, a household is considered multidimensionally poor if its deprivation score is equal to or greater than the poverty cut-off;
4. all members of households defined as multidimensionally poor are also defined as multidimensionally poor.

By changing the cut-off, it is possible to distinguish not only poor households but also those vulnerable to poverty (cut-offs of 20 % and 33 %, indicating a deprivation score between 20 % and 33 %) and those in severe poverty (cut-off greater than 50 %, indicating a deprivation score of more than 50 %).

As stated previously, the UN-MPI is a weighted sum of the deprivations the multidimensionally poor people (not households) experience divided by the total number of people. It may also be expressed as the product of two measures: the multidimensional headcount ratio (H) and the average deprivation share among the poor (A). H is simply the proportion or incidence of people (not households) that are multidimensionally poor. A is the intensity or breadth of the poverty and relates to the average deprivation score of multidimensionally poor people (not households).

The UN-MPI is a single societal poverty measure, which can further be:

- broken down by population group (e.g. geographic area, ethnicity, or other) to show the composition of poverty within and among the groups;
- broken down by dimension/indicator to show which deprivations are driving poverty within and among groups;
- compared across time to monitor changes in poverty and the composition of poverty using time series or panel data;
- used to target the poorest groups and beneficiaries of conditional cash transfers, district interventions or public programmes;
- used to complement other metrics, such as income poverty.

5. The EU Multidimensional Poverty Index — sub-national perspective (MPI-reg)

In order to measure poverty in the EU from a multivariate perspective and at the sub-national level, we build an index that captures poverty in three dimensions (education, health and living standards) and measures multidimensional non-income poverty at the individual level. The index we propose is an aggregate measure of poverty. This means that the index not only shows poverty in three dimensions by one number but also assess poverty in each of the dimensions. This index was already calculated using the EU-SILC waves 2005 – 2011. In this report we added results from the newest wave, namely 2012.

In the following sections, we present data used to estimate poverty levels and details of calculations, meaning framework and aggregation methods.

5.1. Data

To measure poverty in the EU, we used data from the European Survey on Income and Living Conditions (EU-SILC) 2012. The measurement of poverty distribution at the sub-national level was assessed using different with respect to the degree of urbanisation areas within countries..Therefore, the ‘degree of urbanisation’ variable from the EU–SILC 2012 for each of the EU countries, was applied. We identify three types of areas (EC 2013):

1. Densely populated area — contiguous grid cells of one square kilometre with a density of at least 1 500 inhabitants per square kilometre and a minimum population of 50 000 inhabitants;
2. Intermediately populated area — clusters of contiguous grid cells of one square kilometre with a density of at least 300 inhabitants per square kilometre and a minimum population of 5 000;
3. Sparsely populated area — grid cells outside urban clusters.

As Slovenia and the Netherlands do not provide information on the degree of urbanisation, they are not included in the analysis. For Estonia and Latvia, the intermediate level of urbanisation is merged with the level related to the densely populated areas; for Malta, intermediately populated areas are merged with thinly populated ones. Data from 2012 for Belgium and Ireland are not available.

The measurement of poverty conducted with respect to the sub-national units or degree of urbanisation raises the issue of sample size. In our study, the sample size related to each type of

degree of urbanisation within each country is mostly considerably above 1 000 (Table A1 in the Appendix).

5.2. Conceptualisation of MPI-reg

5.2.1. Framework of MPI-reg

Since our aim was to keep the framework of the MPI-reg as similar as possible to the UN's MPI, the MPI-reg comprises three dimensions —living standards, health and education. This approach is also in line with that presented by Callander et al. (2012) and Whelan et al. (2012) who also proposed to distinguish such dimensions of poverty. We tried to populate each of the dimensions with the EU-SILC indicators following the suggestions of Nolan and Whelan (2010) and Whelan et al. (2012) with this respect. The MPI-reg framework and chosen indicators are presented in Table 3.

The finally chosen indicators are different from those proposed by Alkire and Santos (2013) (Section 3.2.1.) mainly because we applied the index to the European sub-national administrative units. Furthermore, our approach related to the developed, instead of developing, as in the approach of Alkire and Santos (2013), countries. Finally, in both approaches, the set of indicators were driven by the data availability.

Table 2: Conceptualisation of MPI-reg

Dimension	Health (Multidimensional Poverty in Health Index MPI-H) (2 out of 3)			Education (Poverty in Education Index MPI-E)	Living Standards (Multidimensional Poverty in Standard of Living Index MPI-L) (1 out of 3)		
Component	General health	Unmet medical need due to lack of affordability and accessibility	Unmet dental need due to lack of affordability and accessibility	Educational attainment	Material deprivation (Material Deprivation Index — MDI) (3 out of 9)	Housing problems (Multidimensional Poverty in Housing Index — MPHoI) (2 out of 5)	Environment (Multidimensional Poverty in Environment Index — MPEnI) (2 out of 3)
Indicator	Reporting bad or very bad health conditions (PH010)	Unmet need for medical examination or treatment because of it was not affordable, there was a waiting list or it was too far to travel/no means of transportation (PH040 and PH050)	Unmet need for dental examination or treatment because of it was not affordable, there was a waiting list or it was too far to travel/no means of transportation (PH060 and PH070)	A person: of more than 24 years not having at least upper secondary education in the age range 16–24 years who has finished no more than lower secondary education and is not involved in further education (based on early school leaver definition) (PE010 and PE040)	Household cannot afford: a telephone (including a mobile phone) (HS070), a computer (HS090), a washing machine (HS100), a car (HS110) Households with arrears on mortgage or rent payments (HS010/HS011) or utility bills (HS020/HS021) Lack of capacity to face unexpected financial expenses (HS060) Lack of capacity in a household to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day (HS050) Lack of capacity in a household to afford paying for one-week annual holiday away from home (HS040) Household without ability to keep home adequately warm (HH050)	Crowding index (average number of people per room available to the household) > 2 (HH030) Problems with dwelling: — leaking roof, damp walls/floors/foundation, or rotten window frames or floor (HH040) — too dark, not enough light (HS160) — without bath or shower for sole use in dwelling (HH080/HH081)	Household experiences: — noise from neighbours or from the street (HS170) — pollution, grime or other environmental problems (HS180) — crime violence or vandalism in the area (HS190)

Most of the indicators selected are available at the household level. The only exceptions are the indicators of educational status and the three indicators of health dimension, namely PH010 (General health), PH040/PH050 (Unmet medical need) and PH060/PH070 (Unmet dental need), which are available at the individual level. Although the vast amount of literature on poverty does not conclude what the most suitable unit of analysis should be, we propose measuring poverty among individuals, namely at the highest resolution. In such an approach, since the indicators of the Living standards dimension are measured at the household level, we assume that if a household is multidimensionally poor, then all its members are multidimensionally poor.

5.2.2. Sub-indexes of MPI-reg

The MPI-reg framework comprises three dimensions — health, education and living standards — quantified by three sub-indexes: the Multidimensional Poverty in Health Index (MPI-H), the Poverty in Education Index (MPI-E) and the Multidimensional Poverty in Living Standards Index (MPI-L), respectively (Table 3). The structure of the first two dimensions, and thus sub-indexes MPI-H and MPI-E, is simple, whereas the structure of the MPI-L is more complex.

5.2.2.1. The sub-index MPI-H

The sub-index MPI-H is directly computed from the indicators derived from the EU-SILC according to the following rule: A person is considered multidimensionally poor with respect to health if they are deprived in at least two out of three health indicators (if their deprivation score is equal to or greater than $2/3$).

Hypothetical example of calculation of the MPI-H (adjusted headcount ratio), headcount ratio (H_{MPI-H}) and intensity (A_{MPI-H})

Assume that in the country there are only four persons.

Step 1: For each person, it is decided if they are poor or not with respect to each health component. For person 1, we have: General health — Yes; Unmet medical need due to lack of affordability and accessibility — Yes; Unmet dental need due to lack of affordability and accessibility — No.

Component	Person 1	Person 2	Person 3	Person 4
General health	1	0	0	1
Unmet medical need due to lack of affordability and accessibility	1	0	1	1
Unmet dental need due to lack of affordability and accessibility	0	0	1	0

Step 2: For each person, the deprivation score with respect to health poverty, which is a weighted sum of the deprivations experienced, is calculated according to the formula:

$$depriv_{score-MPI-H} = \frac{1}{3} * GH + \frac{1}{3} * MD + \frac{1}{3} * DD$$

where GH is general health; MD is unmet medical need; DD is unmet dental need.

For person 1, we have:

$$depriv_{score-MPI-H-1} = \frac{1}{3} * 1 + \frac{1}{3} * 1 + \frac{1}{3} * 0 = \frac{2}{3} = 0.667$$

For person 2, we have:

$$depriv_{score-MPI-H-2} = \frac{1}{3} * 0 + \frac{1}{3} * 0 + \frac{1}{3} * 0 = 0$$

Step 3: For each person, it is decided if they are multidimensionally poor with respect to health — to establish this, the poverty cut-off (the share of weighted deprivations a person must experience in order to be considered poor with respect to health) of 2/3 is set and a person is considered multidimensionally poor with respect to health if their deprivation score is equal or greater than the poverty cutoff of 2/3.

	Person 1	Person 2	Person 3	Person 4
Deprivation score	0.667	0	0.667	0.667
If deprivation score $\geq 2/3$ implying that a person is multidimensionally poor with respect to health	Yes	No	Yes	Yes

Step 4: Calculation of the $MPI-H$, H_{MPI-H} and A_{MPI-H}

The $MPI-H$ is a weighted sum of the deprivations the multidimensionally poor with respect to health people experience divided by the total number of people $MPI_{reg} = \frac{0.667+0.667+0.667}{4} = 0.5$

H_{MPI-H} is the proportion or incidence of people who are multidimensionally poor with respect to health

$$H = \frac{1+1+1}{4} = 0.75$$

A_{MPI-H} relates to the average deprivation score of multidimensionally poor with respect to health people

$$A = \frac{0.667+0.667+0.667}{3} = 0.667$$

The $MPI-H$ may be also expressed as the product of the headcount ratio (H) and the average deprivation share among the poor (A) $MPI-H = H_{MPI-H} * A_{MPI-H}$

$$0.5 = 0.667 * 0.75$$

5.2.2.2. The sub-index MPI-E

As regards the education dimension, since there is only one education indicator calculated differently with respect to age, there is no need and no possibility to calculate the MPI-E. Therefore, a person is defined to be poor with respect to education if they are deprived with respect to educational attainment indicator described in Table 3.

5.2.2.3. The sub-index MPI-L

As stated previously, the structure of the MPI-L is more complex. Not only does the MPI-L comprise lower-level sub-indexes (the Material Deprivation Index (MDI), the Multidimensional Poverty in Housing Index (MPHoI) and the Multidimensional Poverty in Environment Index (MPEnI)) but also all of them are multidimensional in nature. All lower-level indexes are directly computed from the indicators derived from the EU-SILC (all of them referring to households) according to the following rules.

- As regards the MDI, a household is defined to be materially deprived if it is deprived of at least three out of nine indicators (if its deprivation score is equal to or greater than $1/3$) ⁽⁴⁾.
- As regards the MPHoI, a household is defined to be poor with respect to housing if it is deprived of at least two out of five housing indicators (if its deprivation score is greater than $1/3$).
- As regards the MPEnI, a household is defined to be poor with respect to environment if it is deprived of at least two out of three environment indicators (if its deprivation score is greater than $1/3$).

Then the household-level estimate of poverty in living standards is assigned to all household members.

The MPI-L is computed as a composite of its three lower-level sub-indexes. Each of these sub-indexes is associated with equal weight (i.e. $1/3$). Thus, a person is defined to be multidimensionally poor with respect to living standards, if they are deprived of at least one of three living standards sub-indexes (if their deprivation score is at least equal to $1/3$).

⁴ 'Glossary: Material deprivation rate', *Statistics Explained* (2013/8/4) (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=Glossary:Material_deprivation_rate&redirect=no).

Finally, each of the sub-indexes, namely the Multidimensional Poverty in Health Index (MPI-H), the Poverty in Education Index (MPI-E) and the Multidimensional Poverty in Living Standards Index (MPI-L), are also presented as a product of headcount ratio/poverty incidence and average deprivation share among poor (i.e. poverty intensity).

5.2.3. Calculation of the MPI-reg

Although MPI-reg has a three-dimensional structure, in its computation, the component level is also taken into account. More precisely, the formula aiming at defining a multidimensionally poor person comprises lower-level sub-indexes: this is a consequence of our desire to give importance to components of the dimensions. Therefore, a person is defined to be multidimensionally poor if their overall deprivation score is greater than 1/3. The overall deprivation score is computed taking into consideration the following weighting scheme:

- (i) Health dimension (2/6):
 - General health ($1/9 = 2/6 * 1/3$);
 - Unmet medical need due to lack of affordability and accessibility (1/9);
 - Unmet dental need due to lack of affordability and accessibility (1/9);
- (ii) Education dimension (1/6):
 - Educational attainment (1/6);
- (iii) Living standards dimension (3/6):
 - MDI ($1/6 = 1/3 * 3/6$);
 - MPHoI (1/6);
 - MPEnI (1/6).

Accordingly, the deprivation score for each individual with respect to multidimensional poverty is computed according to the formula:

$$depriv_{score} = \frac{1}{9} * GH + \frac{1}{9} * MD + \frac{1}{9} * DD + \frac{1}{6} * EA + \frac{1}{6} * MDI + \frac{1}{6} * MPHoI + \frac{1}{6} * MPEnI,$$

where GH is General health; MD is Unmet medical need; DD is Unmet dental need; EA is Educational attainment.

The MPI-reg is computed as the adjusted headcount ratio (i.e. as a weighted sum of the deprivations of the multidimensionally poor persons, all members of poor households) divided

by the total number of persons in the region (all members of all households). It is also expressed as a product of multidimensional headcount ratio (H) and the average deprivation share among the poor (A).

Although, the MPI-reg was an aggregate measure of poverty, meaning that the index shows poverty in three dimensions (i.e. living standards, health and education), by one number, we opt to calculate not only the fully aggregated MPI-reg but also indexes for all three conceptualised dimensions of poverty. In this decision, we follow the reasoning of Ravallion (2011, p. 237), who noticed that in order to prioritise policies for fighting poverty in a given country (or other geographic area), it is necessary to look at the country's attainments in various dimensions, rather than focusing on its performance with respect to a single composite index. He also adds that 'such an approach does not deny that poverty is "multidimensional"'. Rather, it says that 'forming a single (unidimensional) index may not be particularly useful for sound development policymaking.'

Hypothetical example of calculation of the adjusted headcount ratio (*MPI-reg*), headcount ratio (*H*) and intensity (*A*)

Assume that in the country there are only four persons.

Step 1: For each person, it is decided if they are poor or not with respect to each component. For person 1, we have: General health — Yes; Unmet medical need due to lack of affordability and accessibility — Yes; Unmet dental need due to lack of affordability and accessibility — No; Educational attainment — Yes; MDI — Yes; MPHoI — No; MPEnI — Yes.

Component	Person 1	Person 2	Person 3	Person 4
General health	1	0	0	1
Unmet medical need due to lack of affordability and accessibility	1	0	1	1
Unmet dental need due to lack of affordability and accessibility	0	0	1	0
Educational attainment	1	1	0	0
MDI	1	1	0	0
MPHoI	0	0	0	0
MPEnI	1	0	1	0

Step 2: For each person, the deprivation score, which is a weighted sum of the deprivations experienced, is calculated according to the formula:

$$depriv_{score} = \frac{1}{9} * GH + \frac{1}{9} * MD + \frac{1}{9} * DD + \frac{1}{6} * EA + \frac{1}{6} * MDI + \frac{1}{6} * MPHoI + \frac{1}{6} * MPEnI$$

where GH is General health; MD is Unmet medical need; DD is Unmet dental need; EA is Educational attainment.

For person 1, we have:

$$depriv_{score1} = \frac{1}{9} * 1 + \frac{1}{9} * 1 + \frac{1}{9} * 0 + \frac{1}{6} * 1 + \frac{1}{6} * 1 + \frac{1}{6} * 0 + \frac{1}{6} * 1 = \frac{13}{18} = 0.722$$

For person 4, we have:

$$depriv_{score4} = \frac{1}{9} * 1 + \frac{1}{9} * 1 + \frac{1}{9} * 0 + \frac{1}{6} * 0 + \frac{1}{6} * 0 + \frac{1}{6} * 0 + \frac{1}{6} * 0 = \frac{2}{9} = 0.222$$

Step 3: For each person, it is decided if they are multidimensionally poor — to establish this, the poverty cut-off (the share of weighted deprivations a person must experience in order to be considered poor) of 1/3 is set and a person is considered multidimensionally poor if their deprivation score is greater than the poverty cut-off of 1/3.

	Person 1	Person 2	Person 3	Person 4
Deprivation score	0.722	0.333	0.389	0.222
Is deprivation score > 1/3 implying that a person is multidimensionally poor?	Yes	No	Yes	No

Step 4: Calculation of the *MPI-reg*, *H* and *A*

The *MPI-reg* is a weighted sum of the deprivations the multidimensionally poor people experience divided by the total number of people $MPI_{reg} = \frac{0.722+0.389}{4} = 0.278$

H is the proportion or incidence of people who are multidimensionally poor $H = \frac{1+1}{4} = 0.5$

A relates to the average deprivation score of multidimensionally poor $A = \frac{0.722+0.389}{2} = 0.556$

The *MPI-reg* may be also expressed as the product of the headcount ratio (*H*) and the average deprivation share among the poor (*A*) $MPI_{reg} = H * A$

$$0.278 = 0.5 * 0.556$$

$$MPI_{reg} = H * A$$

Hypothetical example of interpretation of the adjusted headcount ratio (MPI-reg), headcount ratio (H) and intensity (A)

Interpreting the results from the box above:

Headcount ratio: $H = 0.5$ implies that 50 % of people in the country are multidimensionally poor. But to ascertain if they are all equally poor the intensity of poverty (A) has to be examined.

Intensity of poverty: $A = 0.556$ implies that, on average, people who are multidimensionally poor are deprived in 55.6 % of the weighted components.

Adjusted headcount ratio: $MPI\text{-reg} = 0.278$ reflects the proportion of weighted deprivations that the poor experience in a society out of all potential deprivations that the society could experience; the value 0.278 implies that the society is deprived in 27.8 % of the total potential deprivations it could experience overall.

6. The EU MPI-reg — Results

In this section, we present the results showing the distribution of poverty in 2012 across the EU areas differing with respect to population density, namely according to the degree of urbanisation ⁽⁵⁾. Taking into consideration all reservations related to the limited comparability of the ‘old’ and the ‘new’ definition of the degree of urbanisation, we attempted to perform the comparisons of the poverty distribution with respect to degree of urbanisation between 2007 and 2012. We recognise that there is a disjuncture between our approach and the theoretically supported approach and that our choice is not considered best practice theoretically. However, this is intentional and reflects the best approach that is achievable in order to make comparisons between years. Nevertheless, we are aware that it may influence the results and final conclusions.

We start presentation of the results with multidimensional poverty estimates. Although we focus on the MPI-reg, which is an adjusted headcount ratio, we also present the classical headcount ratio and intensity of poverty in the EU areas defined by the degree of urbanisation. The MPI-reg is presented both for countries and for the areas defined by the degree of urbanisation for each EU country (to show the existing variability of poverty within a country). The same strategy applies to three sub-indexes of the MPI-reg, i.e. MPI-H, MPI-E and MPI-L. Each of them is presented both as the adjusted headcount ratio, the classical headcount ratio and the intensity of poverty, both for countries and for the areas defined by the degree of urbanisation for each EU country. Then, we present several scenarios according to different poverty thresholds and weighting schemes to better visualise the influence of the normative methodological choices on the results.

6.1. Multidimensional Poverty Index

While taking into consideration country level estimates of the MPI-reg (see Figure 9 and Table A4 in the Appendix), we can see that in 2012 the best scoring countries (with the lowest poverty level) are Denmark and Sweden with the adjusted headcount ratio (MPI-reg) below 1%. They are followed by France, Austria, the Czech Republic, and Germany – all with the adjusted headcount ratio (MPI_{reg}) below 2%.

⁵ Because our data relates to 2012, we used the ‘new’ classification of the degree of urbanisation as presented in Section 5.1.

A moderate level of poverty (with the adjusted headcount ratio ranging between 2 and 5%) is observed in the United Kingdom, Slovakia, Greece, Finland, Malta, Croatia, and Estonia. Worse situation is noted in the Southern European countries excluding Malta, Greece and Croatia, namely in Cyprus, Italy, Spain, and Portugal, and in the three central and eastern European (CEE) countries (Poland, Hungary, and Lithuania), all with MPI-reg scores ranging from 5 to 10%. The worst situation with respect to poverty measured by the MPI-reg is present in Latvia, Bulgaria, and Romania with MPI_{reg} scores between 12 and 16%.

The countries with a relatively high poverty level also demonstrate considerable dissimilarity among the areas differentiated with respect to the degree of urbanisation (Figure 2 and Table A3 in the Appendix). Considerably higher poverty in thinly populated areas was observed in the CEE countries with the highest differences observed in Romania and Bulgaria. In the case of Romania, the difference in poverty rates between the intermediately populated and the sparsely populated areas amounts to 15.3 percentage points (pp). Regarding Bulgaria, the difference between the densely populated and the sparsely populated areas amounts to 10.4 pp. In both cases the difference reported increased slightly compared to the year 2011, in which it amounted to 11.1 and 7.9 pp., respectively.

On the other end of the scale, there are countries that are almost entirely homogenous with respect to poverty estimates. This group includes the Czech Republic, Denmark, Sweden, France, and Finland, with maximum differences of less than 0.8 pp. In the overall analysis, there are also identified countries with very low differences, such as Cyprus, Germany, Poland, Italy, the United Kingdom, Slovakia, Greece, Portugal, Malta, and Luxembourg with maximum differences of approximately 2 pp. Intermediately differences between the differently populated areas (from 2 to 4.5 pp.) are recorded for Greece, Croatia, Austria, Spain, Hungary, Latvia, and Lithuania.

In general, there is observed a positive relationship ($r = 0.821$, Table 3) between the stratification level and the adjusted headcount ratio (MPI-reg) (Figure 4), implying that the poorer a country is, the greater the differences between differently populated areas. However, as mentioned above, the pattern of differences varies. In the poor and moderately poor countries (from lowest scoring Romania to Croatia), the worst situations with respect to poverty are observed in sparsely populated areas, with an exception of two southern European countries, Italy and Spain, where the worst situations are in densely populated areas and in intermediately populated areas, respectively. On the other hand, in this group of countries the best situation, with respect to poverty, is detected in densely populated areas, with the exception of the southern European

countries, such as Portugal, Spain, Italy and Cyprus, where the worst situations occur in either intermediately populated areas (Portugal and Cyprus) or in thinly populated ones (Italy and Spain). Conversely, in the best scoring countries, poverty is, generally, the level of within-country poverty is homogenous. The only exception is Austria, where the worst situation relative to poverty is noted in densely populated areas, though the differences are not considerable. The above findings indicate that poverty-related country rankings may be misleading because there is considerable stratification of poverty with respect to the degree of urbanisation.

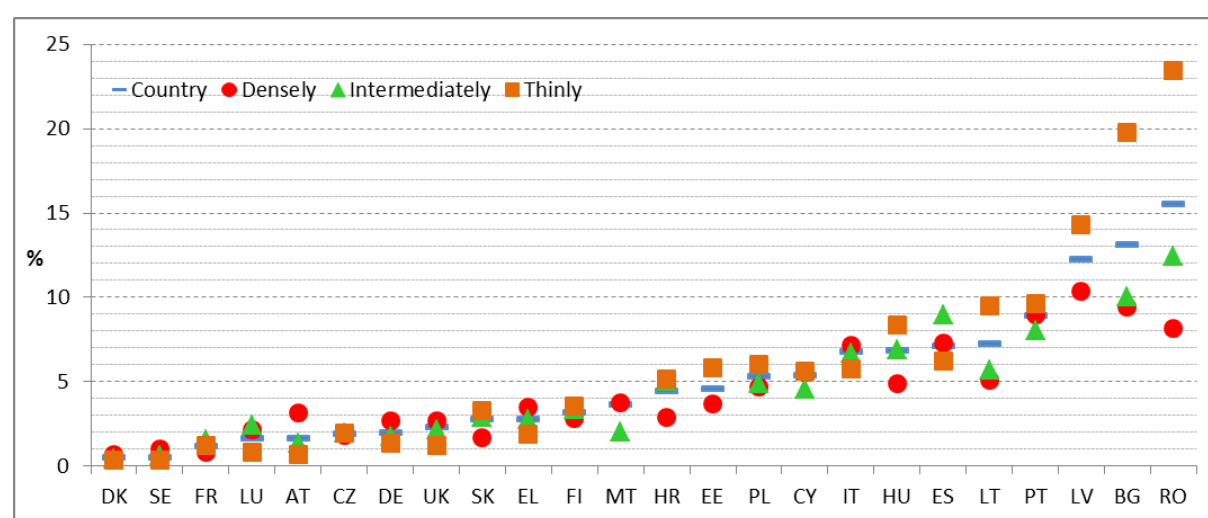


Figure 2: The MPI-reg in 2012 — estimates at country level and by degree of urbanisation

Note: Country = estimate at country level; Densely = densely populated area; Intermediately = intermediately populated area; Thinly = thinly populated area.

In addition to the positive relationship between the stratification level and the MPI-reg, there is also a positive relationship ($r=0.741$, Figure 3) between the level of poverty measured by classical headcount ratio (H) and the intensity of poverty (A). This relationship suggests that in areas where there is a significantly larger number of poor people, these people are also more likely to be poor in more dimensions. The most striking examples of such a situation are thinly populated Latvian, Bulgarian and Romanian areas (Figure 3).

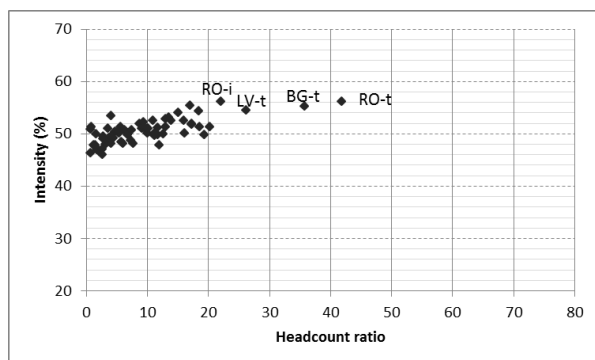


Figure 3: Multidimensional poverty in the EU in 2012: Incidence v Intensity

Note: -d = densely populated area; -i = intermediately populated area; -t = thinly populated area.

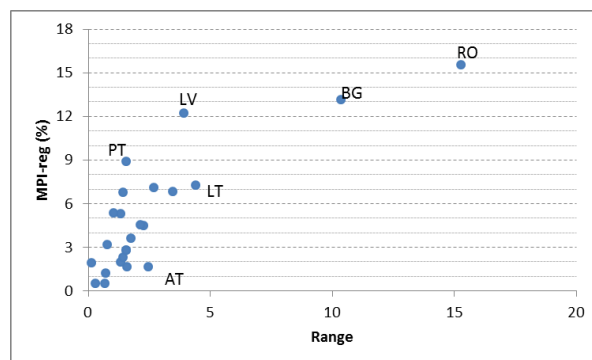


Figure 4: Multidimensional poverty in the EU v Stratification — 2012

Note: Range = difference between the areas with the highest and the lowest values of the MPI-reg

Table 3: Correlation between multidimensional poverty incidence and intensity and between the level of multidimensional poverty and the level of stratification with respect to multidimensional poverty

	Multidimensional poverty incidence and intensity	Multidimensional poverty and the level of stratification
Correlation	0.741	0.821
Number of cases	69	24

In Figure 5, we present the changes in the level of the MPI-reg recorded between 2007 and 2012. The highest changes in the MPI-reg were recorded in Romania and Bulgaria. In Romania a considerable increase of 10 pp. in MPI-reg for thinly populated areas was recorded. In Bulgaria decreases were recorded for all types of areas, however those significant related to densely and intermediately populated areas and amounted to 5 and 7 pp., respectively.

As regards the direction of changes, in Cyprus, France, Greece, Malta, Poland, Portugal and Romania decreases in area-specific levels of poverty were recorded. The situation hardly changed in the Czech Republic, Germany, Denmark, Ireland, Luxembourg, Sweden, Slovakia, and the United Kingdom. Increases in area-specific levels of poverty we observed in Spain, Belgium, Finland, and Lithuania.

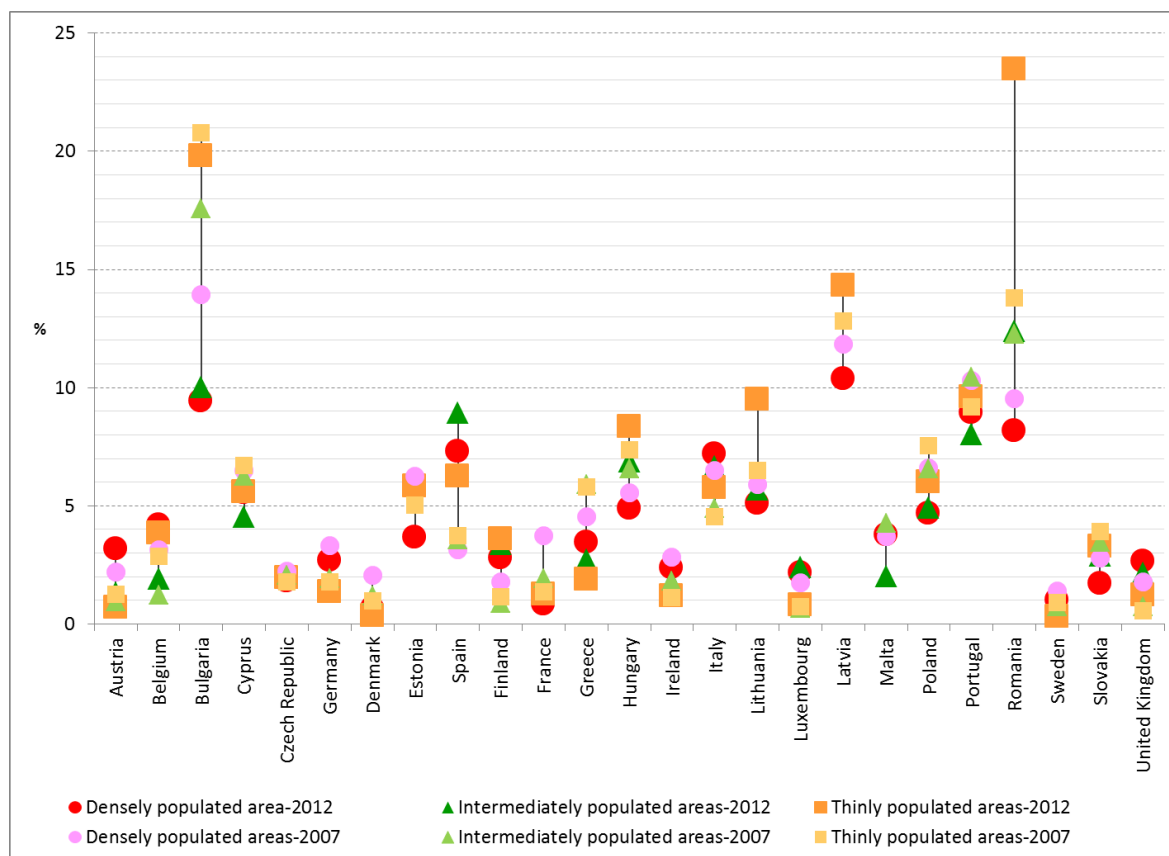


Figure 5: The MPI-reg in 2007 and 2012

Note: For Malta, data are from 2009 instead of 2007; for Ireland, data are from 2010 instead of 2012; for Belgium, data are from 2011 instead of 2012.

6.2. Poverty in education

While taking into consideration country level estimates of the MPI-E (see Figure 6 and Table A4 in the Appendix), we can notice that in 2012 the best scoring countries (with the lowest poverty level) are three CEE countries, namely the Czech Republic, Slovakia and Estonia all with the MPI-E below 20%. They are followed by Germany, Denmark, Sweden, Lithuania, Latvia, and Austria – all with the MPI-E between 20 and 25%. A moderate level of poverty in education (with the MPI-E ranging from 26 to 35%) is observed in Hungary, Finland, Poland, Croatia, the United Kingdom, Bulgaria, France, and Cyprus. A relatively bad situation exists in Romania, and Luxembourg, where the MPI-E ranges from 35 to 40%. Definitely the worst situation with respect to poverty in education is depicted in the Southern European countries excluding Cyprus, namely in Greece, Italy, Spain, Malta and Portugal, all with the MPI-E scores above 40%, and in Malta and Portugal even exceeding 60%.

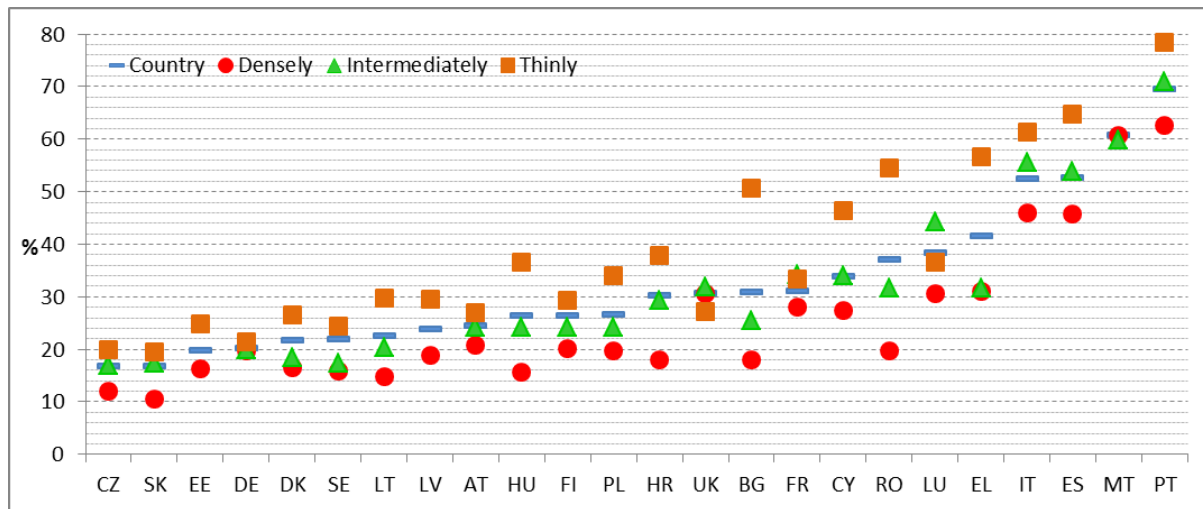


Figure 6: Poverty in education in 2012 — estimates at country level and by degree of urbanisation

Note: Country = estimate at country level; Densely = densely populated area; Intermediately = intermediately populated area; Thinly = thinly populated area.

Differences among the areas differentiated according to the degree of urbanisation observed with respect to poverty in education is considerably higher than with respect to other poverty dimensions and with respect to poverty itself (Figure 6 and Table A3 in the Appendix). Firstly, higher poverty in thinly populated areas is observed in almost all countries. The only exceptions are Luxembourg and the United Kingdom (the same as it was in 2011), where the poorest with respect to education are people from densely or intermediately populated areas, and Malta and Germany, where almost no stratification is spotted (the same as it was in 2011). Secondly, the highest differences with respect to the poverty in education are observed in Romania, Bulgaria, and Greece - the difference in education poverty rates between the densely populated and the sparsely populated areas amounts to 34.9, 32.7, and 25.7, respectively. They were slightly higher compared to the results from 2011 (see Weziak-Białowolska & Dijkstra 2014) in which they amounted to 28.2, 24.9, and 25.1 pp for Romania, Bulgaria, and Greece respectively. High differences are also spotted in Hungary, Croatia, Spain, and Cyprus. It again relates to the differences in education poverty rates between the densely populated and the sparsely populated areas. The difference amounts to 19.1 – 20.9 pp. On the other end of the scale, there are countries that are almost entirely homogenous with respect to education poverty estimates. These are, as mentioned above, Malta and Germany (0.8 and 1.9 pp. difference between densely and sparsely or intermediately, in the case of Malta, populated areas) but also the the United Kingdom with the observed differences below 5 pp.

In the case of poverty in education, there is observed only a weak positive relationship ($r=0.206$, Table 4, Figure 7) between the stratification level and the MPI-E. Although this relationship strengthened compared to the previous year ($r = 0.161$ in 2011, see Weziak-Bialowolska & Dijkstra 2014), it implies that again it is not necessary the case that the poorer with respect to education a country is, the greater the differences between differently populated areas.

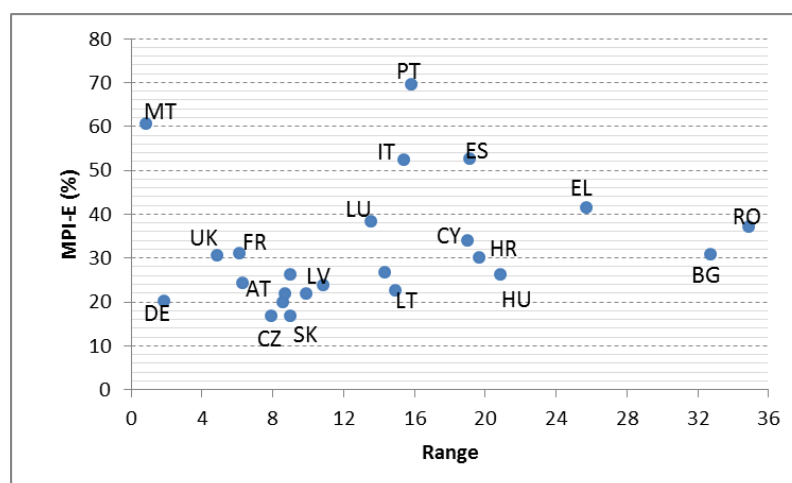


Figure 7: Poverty in education in the EU v Stratification — 2012

Note: Range = difference between the areas with the highest and the lowest values of the MPI-E

Table 4: Correlation between the level of poverty in education and the level of stratification with respect to poverty in education

Correlation	0.206
Number of cases	24

In Figure 8, we present the changes in the level of the MPI-E recorded between 2007 and 2012. Although the country-level distribution of poverty in education in the EU in the period 2007–12 was moderately stable – for all countries the estimates decreased, it was not the case when the degree of urbanisation is taken into account. Namely, almost no changes in area-specific levels of poverty in education in 2007–2012 were recorded in Belgium, Germany, Estonia, Latvia, Malta, Poland, Slovakia, and the United Kingdom. It is worth noting, however, that in the CEE countries mentioned above the differentiation between area-specific levels of poverty in education, despite being constant, were present, whereas in the three western European countries the differentiation was hardly noticeable. In the remaining countries only decreases in

the levels of poverty in education were recorded. However, they do not always relate to all three degrees of urbanisation.

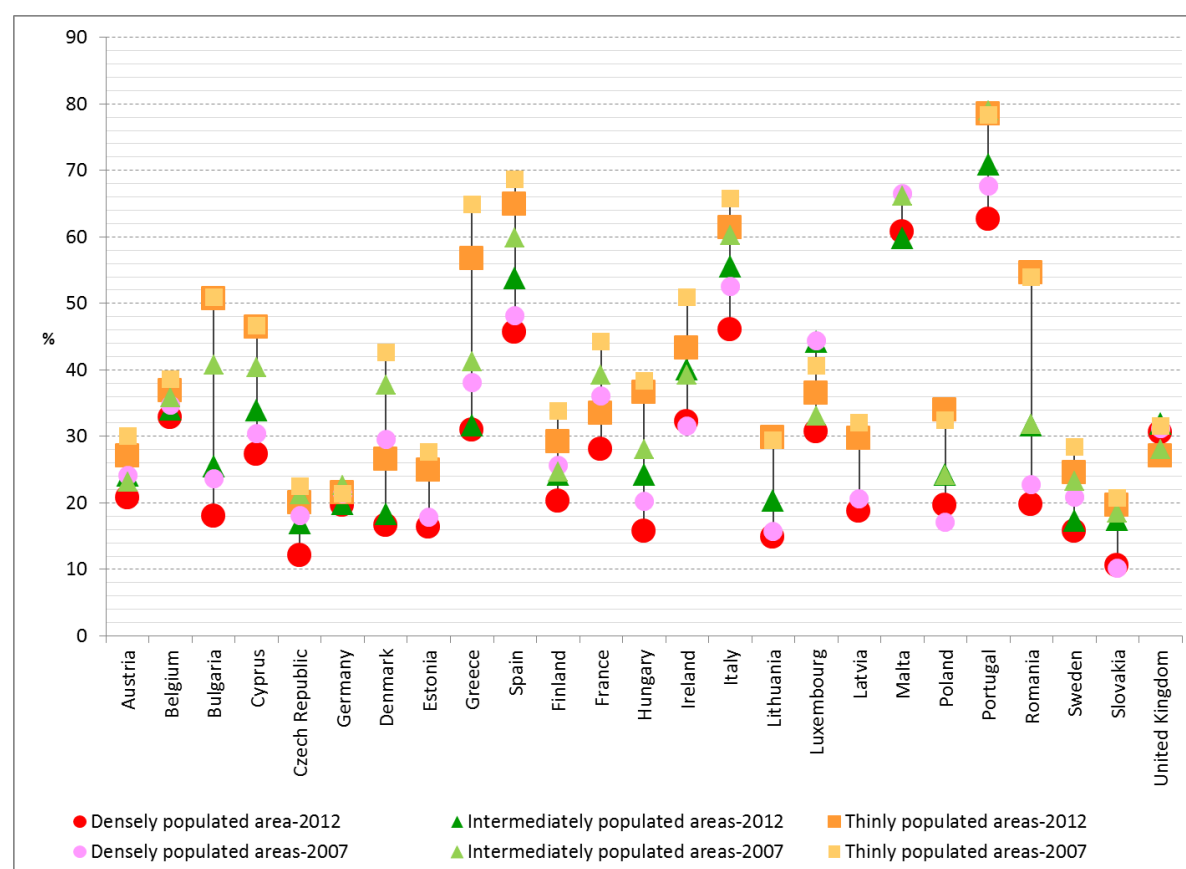


Figure 8: Poverty in education in 2007 and 2012

Note: For Malta, data are from 2009 instead of 2007; for Ireland, data are from 2010 instead of 2012; for Belgium, data are from 2011 instead of 2012.

6.3. Poverty in health

While taking into consideration country level estimates of the adjusted headcount ratio MPI-H (see Figure 9 and Table A4 in the Appendix), we can observe that the best scoring country (with the lowest health related poverty level) are Sweden and Denmark with the MPI-H below 2%. Then Malta, Luxembourg, Austria, and Germany follow – all with the MPI-H below 3%. A moderate level of poverty (with the MPI-H ranging between 3 and 5%) is observed in Finland, the United Kingdom, the Czech Republic, France, Slovakia, and Spain. A relatively bad situation exists in the southern European countries excluding Spain and Malta, namely in Cyprus, Croatia, Greece, and Italy, and in the six CEE countries (Estonia, Hungary, Poland, Lithuania, Bulgaria, and Romania), all with the MPI-H scores ranging from 5 to 10%. The worst situation with respect to poverty in health is depicted in Latvia and Portugal with the MPI-H ranging from 10 to 15%. It is worth noting that in 2012 the level poverty in health in Bulgaria and Romania decreased compared to the level observed in 2011. It resulted in the change of the classification of these two countries. Namely, they do not belong any longer to the group of the worst countries with respect to poverty in health.

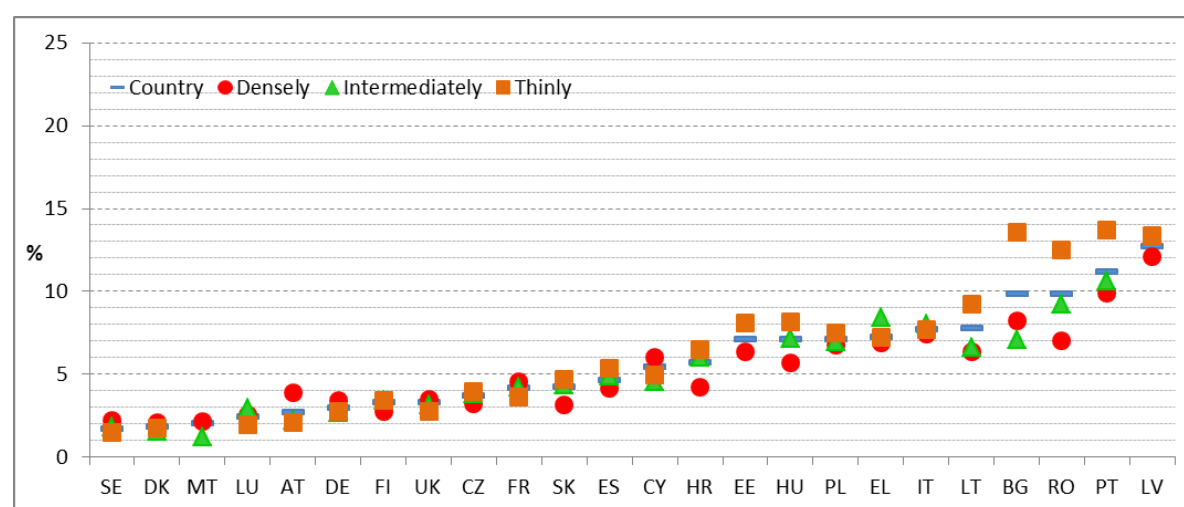


Figure 9: Poverty in health in 2012 — estimates at country level and by degree of urbanisation

Note: Country = estimate at country level; Densely = densely populated area; Intermediately = intermediately populated area; Thinly = thinly populated area.

The countries with a relatively high health poverty level also demonstrate considerable stratification among the areas differentiated according to the degree of urbanisation (Figure 9 and Table A3 in the Appendix). Considerably higher poverty in thinly populated areas is

observed in the CEE countries and Portugal. The highest differences are observed in Bulgaria, Romania, and Portugal - the difference in health poverty rates between the differently populated areas amounts to 6.5, 5.5, and 3.8 pp., respectively. On the other end of the scale, there are countries that are almost entirely homogenous with respect to the health poverty estimates. This group includes Denmark, Italy, Finland, Germany, Sweden, the United Kingdom, the Czech Republic, Poland, Malta, and France, with maximum differences of 0.95 pp.

In general, there is observed a positive relationship ($r = 0.624$) between the stratification level and the adjusted headcount ratio related to health (MPI-H) implying that again the poorer with respect to health a country is, the greater the differences between differently populated areas (Table 5, Figure 11).

It was also observed that a higher incidence of poverty in health coexists with a higher intensity of poverty in health (Figure 10 and Table 5).

Table 5: Correlation between poverty in health incidence and intensity and between the level of health poverty and the level of stratification with respect to health poverty

	Poverty in health incidence and intensity	Poverty in health and the level of stratification with respect to poverty in health
Correlation	0.603	0.624
Number of cases	69	24

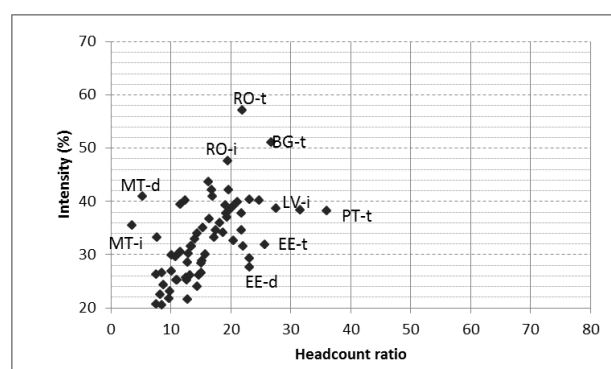


Figure 10: Poverty in health in the EU in 2012: Incidence v Intensity

Note: -d = densely populated area; -i = intermediately populated area; -t = thinly populated area.

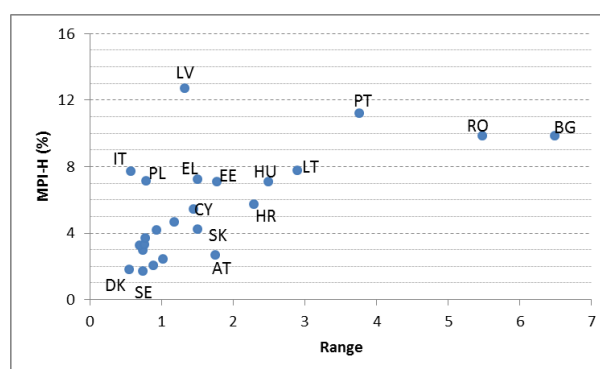


Figure 11: Poverty in health in the EU v Stratification — 2012

Note: Range = difference between the areas with the highest and the lowest values of the MPI-H

In Figure 12, we present the changes in the area-specific levels of the MPI-H recorded between 2007 and 2012. In this period of time considerable changes in within-country distribution of poverty in health were recorded. The most considerable change was observed in Bulgaria, where all area-specific poverty estimates dropped by at least 5 pp., with the specific decrease of almost 10 pp. recorded in intermediately populated areas. In Cyprus, Germany, Denmark, Estonia, Finland, Hungary, Malta, Poland, Romania, and Slovakia decreases in the levels of poverty in health were recorded, too. However, they were of different magnitude and do not always relate to all three degrees of urbanisation.

Almost no changes in area-specific levels of poverty in education in 2007–2012 were recorded in Spain, Ireland, Luxembourg, Latvia, and Sweden. In the remaining countries, namely in Austria, Belgium, Greece, Italy, Lithuania, Portugal, and the United Kingdom increases in the levels of poverty in health were recorded. Generally, they were of lower magnitude and again they do not always relate to all three degrees of urbanisation.

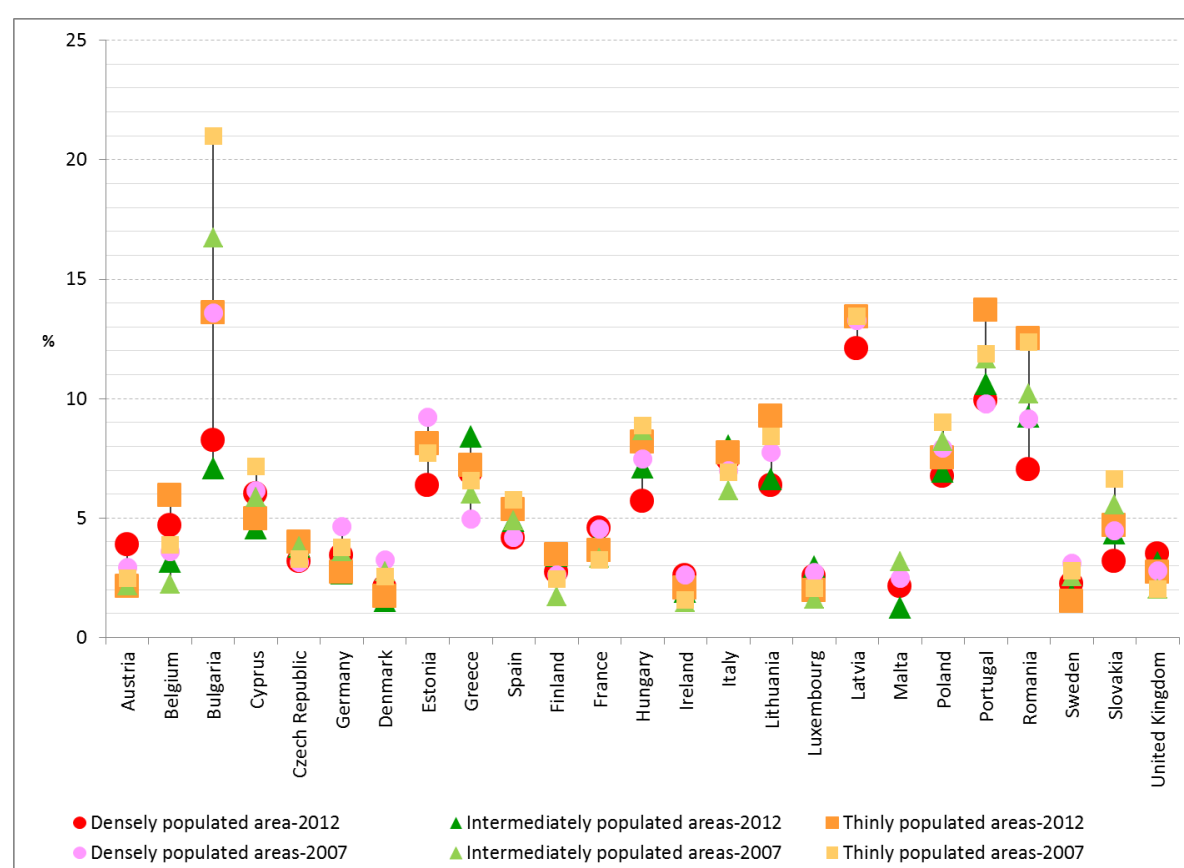


Figure 12: Poverty in health in 2007 and 2012

Note: For Malta, data are from 2009 instead of 2007; for Ireland, data are from 2010 instead of 2012; for Belgium, data are from 2011 instead of 2012.

6.4. Poverty in living standards

While taking into consideration country level estimates of the adjusted headcount ratio MPI-L (see Figure 13 and Table A4 in the Appendix), we can observe that the best scoring country (with the lowest poverty level related to living standards) are Denmark, Sweden, Finland, and Luxembourg, all with the MPI-L below 5%. Austria, France, the United Kingdom, the Czech Republic, Germany, Spain, and Slovakia follow – all with the MPI-L below 10%. A moderate level of poverty (with MPI-L scores between 10 and 15%) is observed in the CEE countries, namely in Estonia, Poland, Croatia and Hungary and in the southern European countries such as Cyprus, Malta, Italy, Portugal, and Greece. Definitely the worst situation with respect to poverty in living standards is depicted in Lithuania and Greece – with the MPI-L around 15%, and in Latvia, Bulgaria, and Romania where the MPI-L is above 20% and it amounts to 20.6, 24.5, and 24.9%, respectively.

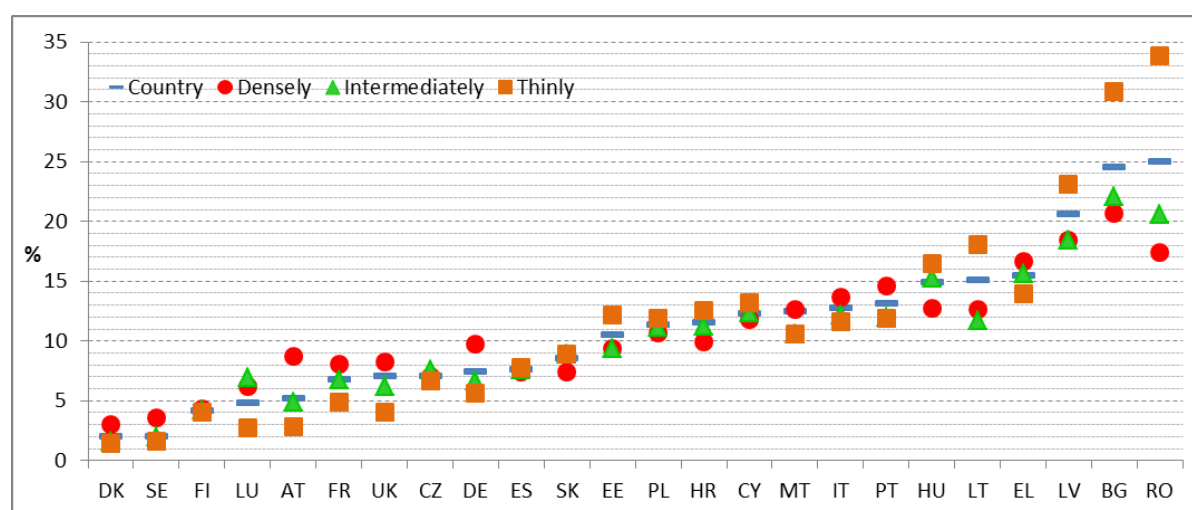


Figure 13: Poverty in living standards in 2012 — estimates at country level and by degree of urbanisation

Note: Country = estimate at country level; Densely = densely populated area; Intermediately = intermediately populated area; Thinly = thinly populated area.

Regarding the differences among the areas differentiated according to the degree of urbanisation, two different patterns can be observed (Figure 13 and Table A3 in the Appendix). There is a group of countries in which considerably higher poverty in densely populated areas is observed. This group includes the more affluent countries with respect to poverty in living standards (i.e. Denmark, Sweden, Austria, France, and the United Kingdom) but also the southern European countries (Malta, Italy, Portugal, and Greece). On the other hand,

considerably higher poverty in thinly populated areas is observed in the CEE countries. It is also worth noting that in high scoring Luxembourg, the lowest poverty is observed in intermediately populated areas.

Undeniably the highest difference between the areas of different degree of urbanisation is observed in Romania. It relates to thinly and densely populated areas and amounts to 16.4 pp. Bulgaria and Lithuania follow, but the observed differences in these cases are considerably lower and amount to 10.3 and 6.3 pp, respectively. These differences are slightly higher than their counterparts recorded in 2011. Slightly lower differences are observed in Austria, Latvia, the United Kingdom, Luxembourg, and Germany, all ranging from 4.1 to 5.8 pp. On the other end of the scale, there are countries that are almost entirely homogenous with respect to living standards poverty estimates, namely with the differences below 1 pp.

In general, our results show that there is observed a relatively strong positive relationship ($r = 0.677$, Table 6, Figure 15) between the stratification level and the adjusted headcount ratio related to living standards (MPI-L). It implies that again the poorer with respect to living standard a country is, the greater the differences between differently populated areas.

In addition to the positive relationship between the stratification level and the MPI-L, there is also a relatively strong positive relationship ($r=0.598$, Table 6) between the level of poverty in living standards measured by classical headcount ratio (H) and the intensity of poverty in living standards (A) (Figure 14). This relationship suggests that in areas where there are a significantly large number of people poor with respect to living standards, these people are also more likely to be poor in more, related to living standards, dimensions.

Table 6: Correlation between poverty in living standards incidence and intensity and between the level of poverty in living standards and the level of stratification with respect to poverty in living standards

	Poverty in living standards incidence and intensity	Poverty in health and the level of stratification with respect to poverty in health
Correlation	0.598	0.677
Number of cases	69	24

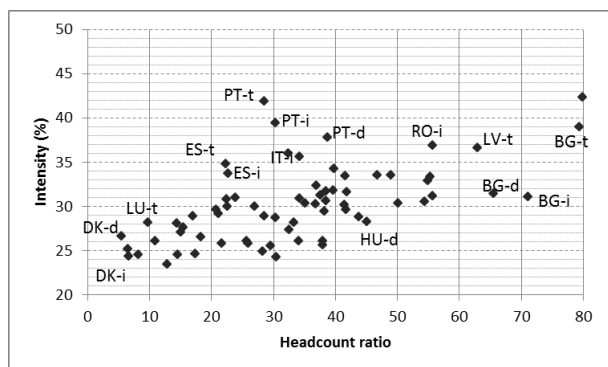


Figure 14: Poverty in living standards in the EU in 2012: Incidence v Intensity

Note: -d = densely populated area; -i = intermediately populated area; -t = thinly populated area.

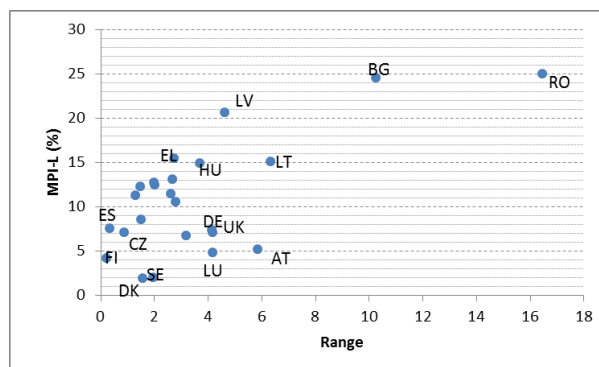


Figure 15: Poverty in living standards in the EU v Stratification — 2012

Note: Range = difference between the areas with the highest and the lowest values of the MPI-L

In Figure 16, we present the changes in the area-specific levels of the MPI-L recorded between 2007 and 2012. In this period of time considerable changes in within-country distribution of poverty in living standards were recorded especially in Romania and in Bulgaria (with respect to all but scarcely populated areas). In the case of Romania the changes were of mixed direction. Namely, a decrease in the MPI-L was observed in both densely and intermediately populated areas, by 5 and 3 pp., respectively. On the other hand, in thinly populated areas an increase in the MPI-L by about 8.5 pp. was recorded. In the case of Bulgaria, level of poverty in living standards remained the same in thinly populated areas. However, it decreased significantly in densely and intermediately populated areas, by 8 and 7 pp., respectively

Almost no changes in area-specific levels of poverty in education in 2007–2012 were recorded in the Czech Republic, Spain, Finland, Ireland, Malta, and Sweden. Then, in Portugal the situation with respect to poverty in living standard were stable in all types of areas but intermediately populated ones. It is worth noting, that all these countries are characterised by very low diversification with respect to poverty in living standards.

Decreases in MPI-L in all types of areas were observed in three countries – in Denmark, Poland, and Slovakia. On the other hand, increases in all types of areas were recorded in France, Greece, and in Italy. In Austria, Belgium, Germany, and the United Kingdom the level of the MPI-L was stable with the exception of densely populated areas where increases were detected. The same applies to Lithuania and Hungary where decreases were observed in intermediately populated areas.

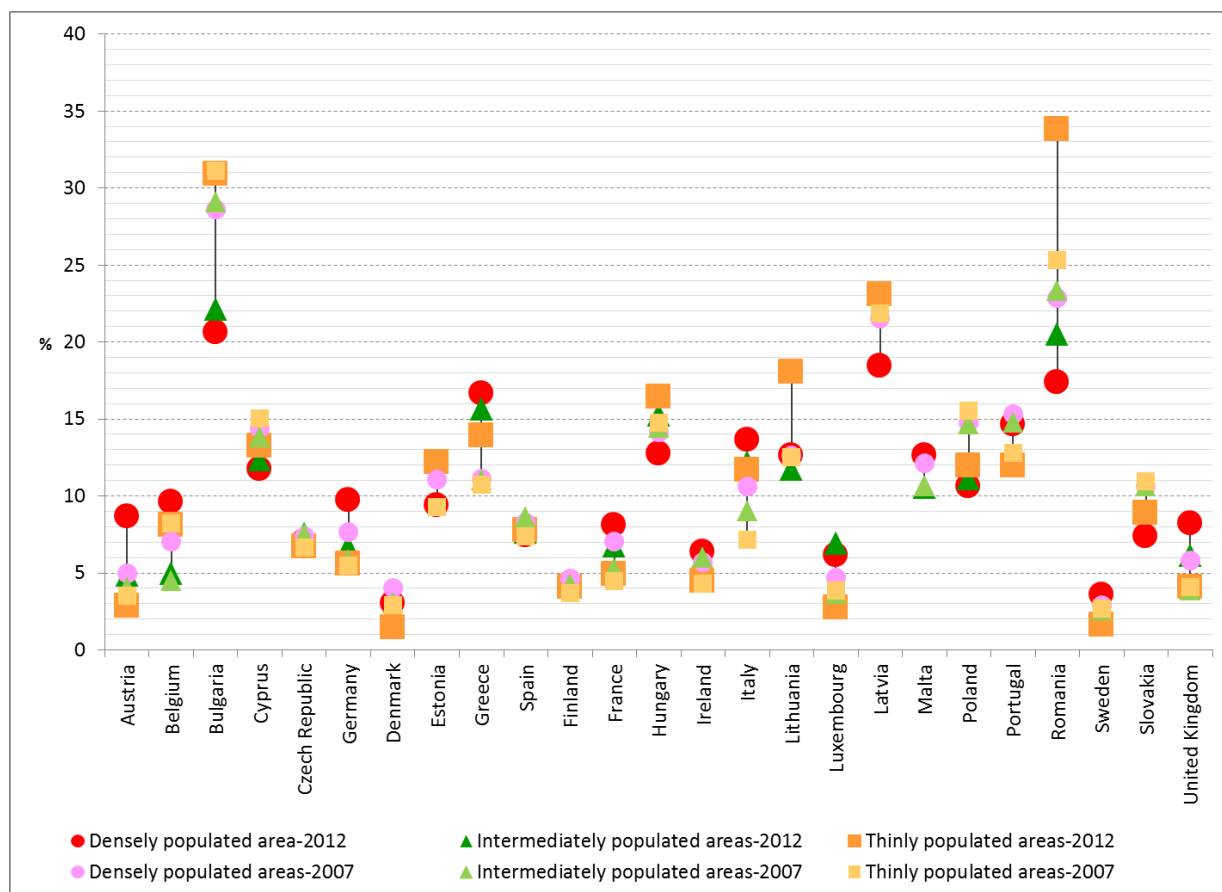


Figure 16: Poverty in living standards in 2007 and 2012

Note: For Malta, data are from 2009 instead of 2007; for Ireland, data are from 2010 instead of 2012; for Belgium, data are from 2011 instead of 2012.

7. Conclusions

The European Union (EU) provides grants to regions lagging behind the other Member States to allow them to catch up with the EU average. In order to correctly address the funds, regions most in need should be identified. To conform to the regional dimension in the EU policy, we measured poverty, understood as economic non-financial deprivation, across the EU at the sub-national level in 2012. To this end we proposed to base the measurement of poverty on the approach currently used by the United Nations (UN), namely the Multidimensional Poverty Index (UN-MPI) by Alkire and Santos (2010, 2013), and to measure within-country poverty with respect to the degree of urbanisation.

To make this report complete and independent from our previously released report on multidimensional non-financial poverty in the EU regions (Weziak-Białowolska & Dijkstra 2014) in this report, we presented again the composite indicator on poverty, namely the Index of Multidimensional Poverty at the regional level (MPI-reg) that is applicable to the European context. With this index and with the data from the European Union Survey on Income and Living Conditions (EU-SILC) 2012, we assessed poverty distribution in the sub-national areas in the European Union in 2012. Then, we compared the situation with respect to non-income poverty between 2007 and 2012.

Poverty was simultaneously evaluated with respect to the fraction of people who live in poverty and also with respect to the poverty intensity that was experienced by them. It was also assessed with respect to each of the dimensions distinguished, namely living standards, health and education, in order to look at the country's attainments in various dimensions, rather than focusing on its performance with respect to a single composite index.

The MPI-reg was computed for 24 EU countries. Unfortunately, due to data unavailability calculations for Belgium, Ireland, the Netherlands, and Slovenia were not executed. However, it was the first time when poverty was assessed for Croatia. Our results show that the level of poverty in the EU ranges from 0.5 % to 13-15 %, with Denmark and Sweden having unequivocally the lowest share of poor people and Latvia, Bulgaria and Romania, having the largest share of poor people. It must be noted, however, that generally, comparing to the situation in 2011, poverty level decreased. The only considerable exception from this reasoning is Portugal, where the MPI-reg increased (1.3 pp.). On the other hand, the most significant decrease in the MPI-reg was recorded in Latvia, Bulgaria, and Romania, i.e., in the least affluent countries with respect to the MPI-reg.

We also indicate that there is a positive relationship between the stratification level and all adjusted headcount ratios, headcount ratios and intensity of poverty scores. This positive relationship implies that there are countries where there is no stratification with respect to poverty (e.g. Sweden, Denmark, the Czech Republic and Finland) and countries, usually poor ones, such as Romania, Bulgaria and Lithuania, where considerable stratification with respect to poverty occurs. In general, in poor and moderately poor countries, the worst situation with respect to poverty is observed in sparsely populated areas, and the best situation occurs in densely populated areas. On the other hand, in the best scoring countries, poverty is relatively higher in the densely populated areas compared to the less well-populated areas.

The results confirmed that the European Union regions are and remained strongly diversified with respect to poverty. This implies that regardless of the spatial location of the region and the definition of the region, considerable within-country differences are indicated if only sub-national levels are available. Therefore, relying only on countrywide estimates may be misleading when properly assessing the relative standing of a region with respect to poverty.

Data citation and disclaimer

This study is based on data from Eurostat, EU Statistics on Income and Living Conditions (2012). The responsibility for all conclusions drawn from the data lies entirely with the authors.

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Appendix

Table A1: Sample sizes in the computation of the MPI_{reg} by degree of urbanization in 2012

DOU	2012	DOU	2012	DOU	2012
AT_1	3299	ES_1	13433	LU_3	6131
AT_2	3203	ES_2	6059	LV_1	6536
AT_3	4975	ES_3	8718	LV_3	6428
BG_1	5062	FI_1	2396	MT_1	9042
BG_2	2830	FI_2	1416	MT_2	1078
BG_3	4973	FI_3	6495	PL_1	8962
CY_1	5515	FR_1	9567	PL_2	7748
CY_2	2423	FR_2	4536	PL_3	14045
CY_3	3106	FR_3	8635	PT_1	4711
CZ_1	4590	HR_1	3115	PT_2	3888
CZ_2	5396	HR_2	2568	PT_3	4985
CZ_3	7324	HR_3	7545	RO_1	4696
DE_1	7501	HU_1	7058	RO_2	3750
DE_2	9897	HU_2	7689	RO_3	7410
DE_3	6189	HU_3	9099	SE_1	1351
DK_1	1688	IT_1	15647	SE_2	1026
DK_2	1156	IT_2	15994	SE_3	4251
DK_3	2498	IT_3	8646	SK_1	3258
EE_1	5262	LT_1	4758	SK_2	4215
EE_3	6640	LT_2	1167	SK_3	6129
EL_1	4346	LT_3	5299	UK_1	9348
EL_2	1228	LU_1	1688	UK_2	5931
EL_3	6124	LU_2	4760	UK_3	3057

Note: _1 – densely populated area, _2 – intermediately populated area, _3 – thinly populated area;

Table A2: List of variables from the EU-SILC

Dimension: Health	Component: General health <p>PH010 “How is your health in general? Is it... very good, good, fair, bad, very bad”</p> <p>The measurement of self-perceived health (SPH) is, by its very nature, subjective. The notion is restricted to an assessment coming from the individual and not from anyone outside that individual, whether an interviewer, health care worker or relative. SPH is influenced by impressions or opinions from others, but is the result after these impressions have been processed by the individual relative to their own beliefs and attitudes. The reference is to health in general rather than the present state of health, as the question is not intended to measure temporary health problems. It is expected to include the different dimensions of health, i.e. physical, social and emotional function and biomedical signs and symptoms. It omits any reference to an age as respondents are not specifically asked to compare their health with others of the same age or with their own previous or future health state. It is not time limited.</p> <p>Five answers categories are proposed. Two (very good and good) are at the upper end of the scale and two (bad and very bad) are at the lower. It is also important to note that the intermediate category ‘fair’ should be translated into an appropriately neutral term (nor good, nor bad), as far as possible keeping in mind cultural interpretations, in the various languages.</p>
	Component: Unmet medical need due to lack of affordability and accessibility which corresponds to the variable: “unmet need for medical examination or treatment because it was not affordable, there was a waiting list or it was too far to travel/no means of transportation”
	<p>PH040 “Unmet need for medical examination or treatment during the last 12 months... when you really needed it: 1 - yes, there was at least one occasion when the person really needed examination or treatment but did not 2 - no, there was no occasion when the person really needed examination or treatment but did not”</p> <p>Concerning medical examination, the aim of the variable is to capture the person’s own assessment of whether he or she needed to consult a medical doctor, but was not able to. (...) Actually, the question is not aimed at assessing the access to specialists but in general to examination by medical doctors (GPs, specialists, etc.). (...) In addition the problems listed in PH050 refer to any doctor in numerous Member States. On the other hand, it should be clear that only real needs of medical examination are taken into account. As a summary, the question aims at covering "core" need as regard to medical care.</p> <p>Regarding the inclusion of other types of treatment, one strategy is to use a form of wording to make clear that we want to include what is regarded as mainstream medicine in the country, i.e. the kinds of things covered by medical insurance. The key concern is with restrictions in access to what would generally be regarded in the society as appropriate treatment for a health condition. Countries will differ in terms of the extent to which specialists such as chiropractors, specialists in acupuncture and so on, have become ‘mainstream’. This may be best accomplished by using an interviewer prompt.</p> <p>In order to ensure that only serious needs are taken into account, it is suggested adding in the question the term "when you really needed ...". The Working Group also suggests adding the word ‘on your own behalf’ to make sure that the consultation/treatment was on the person’s own behalf rather than on behalf of children, spouse, etc. If this is not clarified, any comparison between men and women or between parents and non-parents might be confounded.</p> <p>PH050 - Main reason for unmet need for medical examination or treatment: 1 - Could not afford to (too expensive) 2 - Waiting list 3 - Could not take time because of work, care for children or for others 4 - Too far to travel/no means of transportation</p>

	<p>5 - Fear of doctor/hospitals/examination/ treatment 6 - Wanted to wait and see if problem got better on its own 7 - Didn't know any good doctor or specialist 8 - Other reasons</p> <p>This is a follow-up question to the previous one. It aims capture the dimension of restricted access to health care by including not only formal health care coverage (by insurance or universal coverage), but also restrictions due to rationing, waiting lists, the ability to afford care, and other reasons.</p> <p>In the proposed classification for this item, option 2 (length of the waiting list) should be used for people who were actually on a waiting list and were not helped, for respondents who were discouraged from seeking care because of perceptions of the long waiting lists, as well as people who have 'applied' and are still waiting to see a medical specialist.</p> <p>'Not covered by insurance' should be coded as 'could not afford to' if the respondent could not afford to pay for the treatment/examination himself or herself. The issue on the perception of "Could not afford to (too expensive)" should be tackled in order to not include reaction about "too expensive" which are relative (more expensive than before, etc.) but relate only to the fact that the person could not pay the price, not having money enough for this. The fact that the price is not covered by an insurance fund is in particular an important element to be taken into account.</p> <p>Component: Unmet dental need due to lack of affordability and accessibility which corresponds to the variable “unmet need for dental examination or treatment because of it was not affordable, there was a waiting list or it was too far to travel/no means of transportation”</p> <p>PH060 - Unmet need for dental examination or treatment during the last 12 months, when you really needed it: 1 - yes, there was at least one occasion when the person really needed dental examination or treatment but did not 2 - no, there was no occasion when the person really needed dental examination or treatment but did not”</p> <p>The aim of the variable is to capture the person's own assessment of whether he or she needed to consult a dentist, but was not able to. The same comments as for PH040 (above) shall be considered.</p> <p>PH070: Main reason for unmet need for dental examination or treatment 1 - Could not afford to (too expensive) 2 - Waiting list 3 - Could not take time because of work, care for children or for others 4 - Too far to travel/no means of transportation 5 - Fear of doctor(dentist)/hospitals/examination/ treatment 6 - Wanted to wait and see if problem got better on its own 7 - Didn't know any good dentist 8 - Other reasons The same comments as for PH050 (above) shall be considered.</p>
Dimension: Education	<p>Component: Educational Attainment</p> <p>A person: - in the age of more than 24 years does not have at least upper secondary education - in the age of 16-24 has finished no more than lower secondary education and is not involved in further education; Based on variables PE010, PE040 and age</p> <p>PE010 - Current education activity (Education, including highest ISCED level attained) 1 - in education; 2 - not in education; The concept is whether the person is currently participating in an educational program. An educational program, as defined under ISCED-97, is “an array or sequence of educational activities, which are organised to accomplish a pre-determined objective or a specified set of educational tasks” (UNESCO, 1999, p. 5).</p>

	<p>The person's participation in this programme may be on a full-time attendance basis, a part-time attendance basis or by correspondence course. This variable only covers the regular education system (formal education, including schools, colleges and universities).</p> <p>Formal education is defined as education and training with the following characteristics: (1) purpose and format are predetermined; (2) provided in the system of schools; (3) colleges, universities and other educational institutions; (4) it normally constitutes a continuous ladder of education; (5) it is structured in terms of learning objectives, learning time and learning support; (6) it is normally intended to lead to a certification recognised by national authorities qualifying for a specific education/programme); (7) corresponds to the programmes covered by the UOE-questionnaires.</p> <p>The following adult programmes cannot be classified using ISCED-97: (1) vocational education organized by a firm without leading to an official award or certification; (2) any non-formal education without leading to an official award or certification individual cultural activities for leisure</p> <p>PE040: Highest ISCED level attained 0-pre-primary education, 1-primary education, 2-lower secondary education, 3-(upper) secondary education, 4-post-secondary non tertiary education, 5-first stage of tertiary education (not leading directly to an advanced research, qualification), 6-second stage of tertiary education (leading to an advanced research qualification)</p> <p>Educational attainment of a person is the highest level of an educational programme the person has successfully completed and the study field of this programme. The educational classification to be used is the International Standard Classification of Education (ISCED 1997) coded according to the seven ISCED-97 categories. The basic unit of classification in ISCED-1997 is the educational programme. Educational programmes are defined "on the basis of their educational content as an array or sequence of educational activities, which are organised to accomplish a pre-determined objective or a specified set of educational tasks".</p> <p>The expression 'level successfully completed' must be associated with obtaining a certificate or a diploma when there is a certification. In cases where there is no certification, successful completion must be associated with full attendance or acquired competences to access the upper level. When determining the highest level, both general and vocational education/training should be taken into consideration.</p>
Dimension: Living Standards	<p>Component: Material Deprivation</p> <p>Household cannot afford: Do you have ... ? Does your household have ...? If you do not have ..., (a) would you like to have it but cannot afford it, or (b) do you not have one for other reasons e.g. you do not want or need it. 1-yes, 2-no, cannot afford, 3-no, other reason; HS070: a telephone (including mobile phone) HS090: a computer HS100: An automatic washing machine or a washer-dryer or a non-automatic 'twin-tub'. HS110: a car/van for private use</p> <p>Households with arrears on mortgage or rent payments or utility bills HS010/HS011: In the last twelve months, has the household been in arrears, i.e. has been unable to pay on time due to financial difficulties for: (a) rent, (b) mortgage repayment for the main dwelling? Values: 1-yes, once; 2-yes, twice or more; 3-no; HS020/HS021: In the last twelve months, has the household been in arrears, i.e. has been unable to pay on time due to financial difficulties for utility bills (heating, electricity, gas, water, etc.) for the main dwelling? Values: 1-yes, once; 2-yes, twice or more; 3-no;</p> <p>Lack of capacity to face unexpected financial expenses HS060: Can your household afford an unexpected required expense (amount to be filled) and pay through its own resources? Values: 1-yes; 2-no;</p>

	<p>"Own resources" means:</p> <ul style="list-style-type: none"> - Your household does not ask for financial help from anybody - Your account has to be debited within the required period - Your situation regarding potential debts is not deteriorated. <p>You do not pay through own resources if you pay in instalments (or by taking a loan) expenses that you previously used to pay in cash.</p> <p>"Required expenses" means: A required expense could be different across countries but examples are surgery, funeral, major repair in the house, replacement of durables like washing machine, car.</p> <p>For the calculation of the amount that should be filled in the questionnaire the national at-risk-of-poverty threshold has to be used per one consumption unit, that means it has to be used independently of the size and structure of the household.</p>
	<p>Lack of capacity in a household to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day</p> <p>HS050: Can your household afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day? Values: 1=yes, 2=no;</p>
	<p>Lack of capacity in a household to afford paying for one week annual holiday away from home</p> <p>HS040: Can your whole household afford to go for a week's annual holiday, away from home, including stays in second dwelling or with friends/relatives? Values: 1=yes, 2=no;</p> <p>This question focuses mainly on affordability of some aspects of living standards. The wording of the question refers to the affordability and to the actual meaning "ability to pay" i.e. "the household has the resources to afford..." regardless if the household wants it. The answer is 'YES' if, according to the household respondent, the whole household can afford to go for a week's annual holiday away from home. If the household can (only) afford holidays by using its "social network" (friends, etc.) or can afford subsidized holidays (government schemes), or its second dwelling the answer should be 'YES'. These cases are included in this particular variable as it is not possible to specify the amount that is needed for a household to have a week's holiday per year, in many cases, where the household makes use of its 2nd dwelling for holidays or staying with friends, it could still generate cost and also, the case of subsidized holidays is in fact considered as an "invisible" part of the household's income. The cases where the household cannot go e.g. because of "shortage of time" are not included (answer should be 'YES').</p> <p>If at least one household member cannot afford to go for holidays the answer should be 'NO' (e.g. in cases where parents can afford to send children to a summer camp but cannot afford to go for a holiday for themselves, or where a grown-up son or daughter can afford a holiday but other household members cannot).</p> <p>"Whole household" does not mean that the members of the household have to go all together and at the same time for holidays.</p> <p>If the household finances its holidays through borrowing (from bank, relatives or friends) it is considered in the same way as if the household manages to pay through own resources.</p>
	<p>Household without ability to keep home adequately warm</p> <p>HH050: Can your household afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day? Values: 1=yes, 2=no;</p>
	<p>Component: Housing Problems</p>
	<p>Crowding index >2</p> <p>HH030: Number of rooms available to the household</p>
	<p>Problems with dwelling:</p>

	<p>– leaking roof, damp walls/floors/foundation, or rot window frames or floor;</p> <p>HH040: Do you have any of the following problems with your dwelling / accommodation? (1) a leaking roof, (2) damp walls/floors/foundation, (3) rot in window frames or floor; Values: 1-yes, 2-no;</p> <p>– too dark, not enough light;</p> <p>HS160: Is your dwelling too dark, meaning is there not enough day-light coming through the windows? Values: 1-yes, 2-no;</p> <p>It is recommended to consider the dwelling as ‘too dark, without enough day-light’ in the situation of a sunny day that means that artificial lighting is not to be taken into account.</p> <p>– without bath or shower for sole use in dwelling;</p> <p>HH080/HH081: Is there a shower unit or a bathtub in your dwelling? Values: 1-yes, for sole use of the household; 2-yes, shared; 3-no;</p> <p>A shower unit or bathtub outside the dwelling are not to be considered in this item. On the other hand, it is not required that the shower unit or the bath occupy a separate room.</p>
	<p>Component: Environment</p> <p>Household experiences:</p> <p>– noise from neighbors or from the street;</p> <p>HS170: Do you have any of the following problems related to the place where you live? Too much noise in your dwelling from neighbours or from outside (traffic, business, factory, etc.)? Values: 1-yes,2-no;</p> <p>The objective is to assess whether the respondent feels ‘noise from neighbours or from outside’ to be a problem for the household (not on the fact to be bothered by the problem).</p> <p>Noise from neighbours could be described as noise from neighbouring apartments, staircase or water pipe. Noise from outside should be described as noise linked to traffic (street or road, plane, railway), linked to business, factories, agricultural activities, clubs and yard.</p> <p>– pollution, grime or other environmental problems</p> <p>HS180: Do you have any of the following problems related to the place where you live? Pollution, grime or other environmental problems in the local area such as: smoke, dust, unpleasant smells or polluted water? Values: 1-yes, 2-no; The objective is to assess whether the respondent feels ‘pollution, grime,...’ to be a problem for the household (not on the fact to be bothered by the problem).</p> <p>– crime violence or vandalism in the area;</p> <p>HS190: Do you have any of the following problems related to the place where you live? Crime, violence and vandalism in the local area? Values: 1-yes, 2-no;</p> <p>Crime is to be defined as a deviant behaviour that violates prevailing norms, specifically, cultural standards prescribing how humans ought to behave normally. A legalistic approach is not to be used (this is not defined as any blameworthy act or oversight banned by law and penalized by the State).</p>

Table A3: MPI-reg, MPI-H, MPI-E, and MPI-L by degree of urbanisation in 2012

country	degree of urbanisation	MPI-reg	MPI-H	MPI-E	MPI-L
AT	AT_1	3.2%	3.9%	20.7%	8.7%
AT	AT_2	1.3%	2.2%	24.1%	4.9%
AT	AT_3	0.7%	2.1%	27.0%	2.8%
BG	BG_1	9.4%	8.3%	18.0%	20.6%
BG	BG_2	10.0%	7.1%	25.5%	22.1%
BG	BG_3	19.8%	13.6%	50.7%	30.9%
CY	CY_1	5.5%	6.0%	27.3%	11.8%
CY	CY_2	4.5%	4.6%	34.0%	12.4%
CY	CY_3	5.6%	4.9%	46.4%	13.2%
CZ	CZ_1	1.8%	3.2%	12.1%	7.0%
CZ	CZ_2	2.0%	3.8%	17.0%	7.6%
CZ	CZ_3	1.9%	4.0%	20.0%	6.7%
DE	DE_1	2.7%	3.4%	19.6%	9.7%
DE	DE_2	1.8%	2.7%	19.8%	6.7%
DE	DE_3	1.4%	2.7%	21.5%	5.6%
DK	DK_1	0.7%	2.1%	16.6%	3.0%
DK	DK_2	0.4%	1.5%	18.4%	1.7%
DK	DK_3	0.4%	1.7%	26.5%	1.4%
EE	EE_1	3.7%	6.3%	16.3%	9.4%
EE	EE_3	5.8%	8.1%	24.9%	12.2%
EL	EL_1	7.3%	6.9%	30.9%	16.6%
EL	EL_2	8.9%	8.4%	31.7%	15.7%
EL	EL_3	6.3%	7.2%	56.6%	13.9%
ES	ES_1	2.8%	4.2%	45.7%	7.4%
ES	ES_2	3.4%	4.9%	53.8%	7.6%
ES	ES_3	3.6%	5.4%	64.8%	7.8%
FI	FI_1	0.8%	2.7%	20.2%	4.3%
FI	FI_2	1.5%	3.4%	24.2%	4.3%
FI	FI_3	1.3%	3.4%	29.2%	4.1%
FR	FR_1	3.5%	4.6%	28.1%	8.1%
FR	FR_2	2.7%	4.2%	34.2%	6.8%
FR	FR_3	1.9%	3.6%	33.4%	4.9%
HR	HR_1	2.9%	4.2%	18.1%	9.9%
HR	HR_2	5.0%	6.0%	29.4%	11.3%
HR	HR_3	5.2%	6.5%	37.8%	12.5%
HU	HU_1	4.9%	5.7%	15.7%	12.7%
HU	HU_2	6.9%	7.1%	24.3%	15.2%
HU	HU_3	8.4%	8.2%	36.6%	16.4%
IT	IT_1	7.2%	7.5%	46.0%	13.6%
IT	IT_2	6.7%	8.0%	55.6%	12.2%
IT	IT_3	5.7%	7.7%	61.4%	11.7%
LT	LT_1	5.1%	6.3%	14.9%	12.6%
LT	LT_2	5.7%	6.6%	20.4%	11.7%
LT	LT_3	9.5%	9.3%	29.8%	18.1%
LU	LU_1	2.2%	2.6%	30.6%	6.2%

LU	LU_2	2.4%	3.0%	44.2%	6.9%
LU	LU_3	0.8%	2.0%	36.5%	2.7%
LV	LV_1	10.4%	12.1%	18.8%	18.5%
LV	LV_3	14.3%	13.4%	29.6%	23.1%
MT	MT_1	3.8%	2.1%	60.7%	12.6%
MT	MT_2	2.0%	1.2%	59.9%	10.6%
PL	PL_1	4.7%	6.7%	19.6%	10.6%
PL	PL_2	4.9%	6.9%	24.3%	11.1%
PL	PL_3	6.0%	7.5%	34.0%	11.9%
PT	PT_1	8.9%	9.9%	62.6%	14.6%
PT	PT_2	8.0%	10.6%	70.9%	12.0%
PT	PT_3	9.6%	13.7%	78.4%	11.9%
RO	RO_1	8.2%	7.0%	19.7%	17.4%
RO	RO_2	12.4%	9.2%	31.7%	20.5%
RO	RO_3	23.5%	12.5%	54.6%	33.8%
SE	SE_1	1.0%	2.3%	15.8%	3.6%
SE	SE_2	0.6%	1.8%	17.4%	2.0%
SE	SE_3	0.3%	1.5%	24.5%	1.6%
SK	SK_1	1.7%	3.2%	10.6%	7.4%
SK	SK_2	2.9%	4.4%	17.4%	8.9%
SK	SK_3	3.3%	4.7%	19.6%	8.9%
UK	UK_1	2.7%	3.5%	30.6%	8.2%
UK	UK_2	2.2%	3.2%	32.0%	6.2%
UK	UK_3	1.2%	2.7%	27.1%	4.1%

Table A4: MPI-reg, MPI-H, MPI-E, and MPI-L by country in 2012

country		MPI-reg	MPI-H	MPI-E	MPI-L
Austria	AT	1.6%	2.7%	24.3%	5.2%
Bulgaria	BG	13.1%	9.8%	30.9%	24.5%
Cyprus	CY	5.3%	5.4%	33.8%	12.3%
Czech Republic	CZ	1.9%	3.7%	16.7%	7.1%
Germany	DE	2.0%	2.9%	20.2%	7.4%
Denmark	DK	0.5%	1.8%	21.7%	2.0%
Estonia	EE	4.5%	7.1%	19.8%	10.5%
Greece	EL	7.1%	7.2%	41.5%	15.4%
Spain	ES	3.1%	4.6%	52.6%	7.6%
Finland	FI	1.2%	3.3%	26.3%	4.1%
France	FR	2.8%	4.2%	31.1%	6.7%
Croatia	HR	4.4%	5.7%	30.2%	11.5%
Hungary	HU	6.8%	7.1%	26.2%	14.9%
Italy	IT	6.7%	7.7%	52.3%	12.7%
Lithuania	LT	7.2%	7.8%	22.4%	15.1%
Luxembourg	LU	1.6%	2.4%	38.4%	4.8%
Latvia	LV	12.2%	12.7%	23.8%	20.6%
Malta	MT	3.6%	2.0%	60.6%	12.4%
Netherlands	NL	0.9%	2.2%	31.5%	4.9%
Poland	PL	5.3%	7.1%	26.6%	11.3%
Portugal	PT	8.9%	11.2%	69.5%	13.1%
Romania	RO	15.5%	9.8%	37.0%	24.9%
Sweden	SE	0.5%	1.7%	21.8%	2.0%
Slovenia	SI	2.9%	4.5%	27.2%	8.1%
Slovakia	SK	2.8%	4.2%	16.7%	8.5%
United Kingdom	UK	2.3%	3.3%	30.5%	7.1%

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